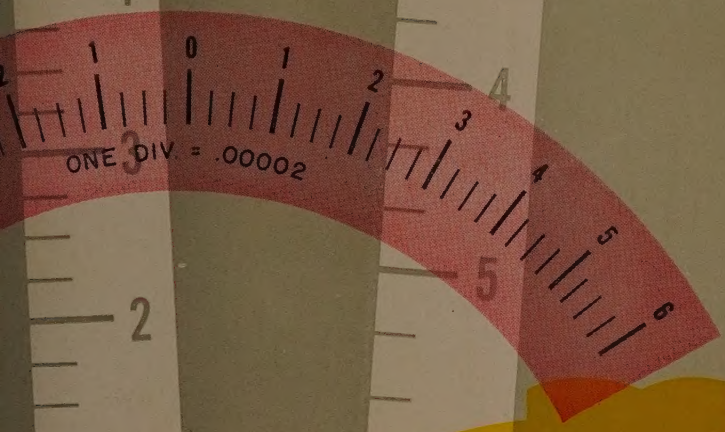
MARCH 15, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



LOS ALAMOS

Production Gaging . . .

Industry watches its waste line — page 98

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A Fast Start!

Pictured above are some of the Allis-Chalmers control installations at Granite City Steel.

Left — *Regulex* amplifier exciter sets provide sensitive control for variable voltage dc drives.

Center — Constant voltage control panels for dc auxiliary drives.

Right — Liquid rheostat provides stepless speed control for 7000-hp m-g set.

Regulex is an Allis-Chalmers trademark.

NEW GRANITE CITY "BLOOMER" GOES INTO PRODUCTION WITHOUT SHAKEDOWN

All control for main and dc auxiliary drives in the new blooming mill at Granite City Steel was supplied by Allis-Chalmers. Significantly, near capacity production started immediately . . . without a costly shakedown. In fact, eight days later the old mill was taken out since it was apparent that standby equipment was not needed.

Noteworthy, too, is the fact that the installation was completed *on time*. Controls were factory assembled, thus simplifying and speeding installation.

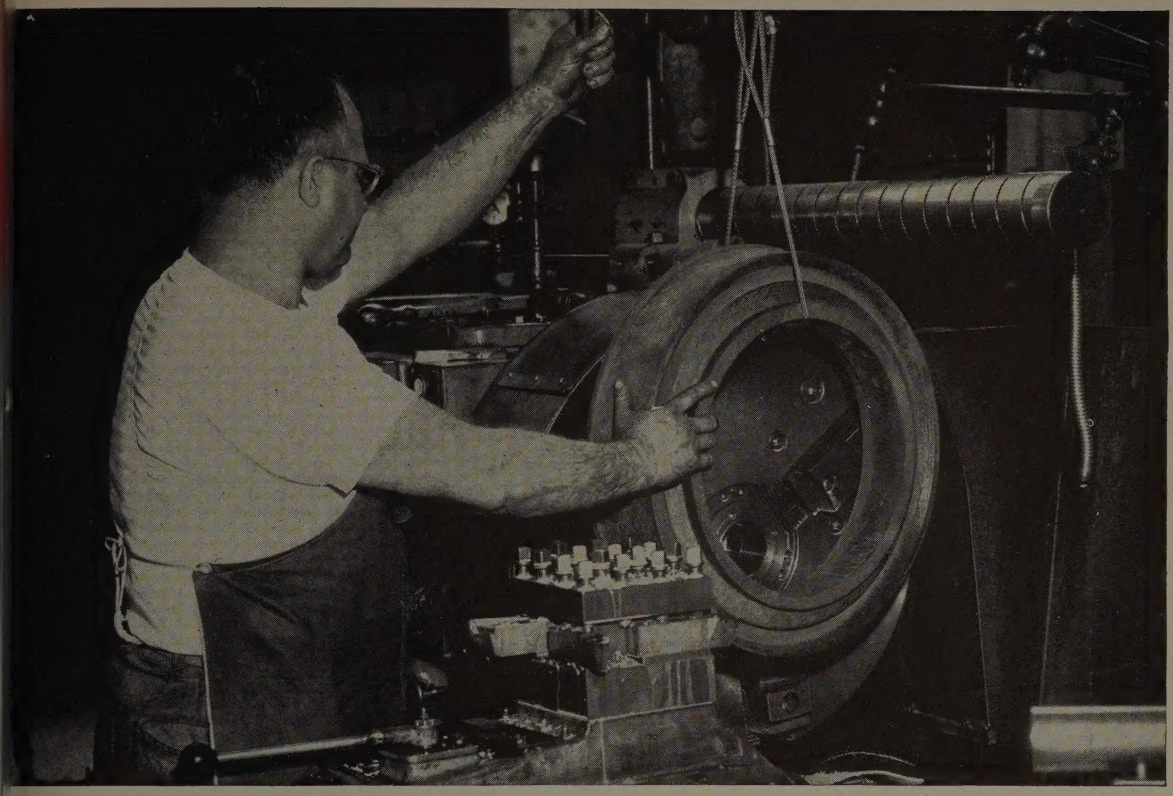
Progressive Granite City Steel has standardized on Allis-Chalmers electrical equipment in its large expansion program. The recently completed blooming mill is the first stage in a three-stage plan. When completed, this realistic, farsighted expansion will push production to well over a million ingot tons annually.

Why not put Allis-Chalmers skill and experience to work for you? Call your nearby A-C steel mill representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4114

ALLIS-CHALMERS

A-C ALLIS-CHALMERS



Circular blank being positioned for machining at a General Electric plant.

So Many Uses for These Sturdy, Low-Cost Blanks

f the products you make require the se of circular steel blanks, we have omething that will interest you. We nean Bethlehem's circular forgings, s they are known to the trade. Actually, these strong, homogeneous blanks are both forged and rolled, vith the attendant benefits of the wo-way process.

Customers use them for making gears, including spur, bevel, and herringbone; crane-track wheels, end rings, sheave wheels, turbine rotors, flywheels, tire molds and rings, industrial wheels, pistons, clutch drums, and similar parts. For all such applications Bethlehem blanks are the solid, logical choice—the ideal choice, really.

Large spur gears made from Bethlehem blanks.

We have mentioned that they are strong. Other advantages include excellent grain flow and uniform density of metal. Because of this latter feature, machinists can take cuts of required depth with confidence; fewer finishing cuts are required, and the cutting speed is often higher.

Your own firm can probably find plenty of uses for these sturdy forged-and-rolled steel blanks. They are available in a wide range of sections, and they can be furnished untreated or heat-treated, as you prefer. Sizes run from 10 in. to 42 in. OD.

We're always glad to tell you the full story, any time you wish. But before we do, perhaps you'd like to send for our Booklet 216. It shows how the blanks are made, and how they are used by many well-known companies. Write for a copy today.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM FORGED-AND-ROLLED CIRCULAR BLANKS

The mooring mast that was never used!

IN MID MANHATTAN there stands a monument to a dream. A 1250-foot mooring mast that was never used!

When the Empire State Building was designed, the huge rigid-frame dirigible looked like the coming thing in air transportation. So, atop the world's tallest building, they placed a giant mooring mast. Yet before the building was finished, so was the dirigible balloon!

Why? It was knocked out of the race by the oldest law on the books. Darwin called it the survival of the fittest. We call it competition, but it means the same thing. In today's highly competitive market, it means that new ways *must be found* to produce a higher quality product, at lower cost.

That's where latest Heald equipment and a fresh Heald viewpoint can help you come out ahead in the struggle for survival. Long runs or short, single or multi-purpose setups, Heald machines provide a sure way to improve product quality, speed production and cut unit costs.

Competition is wonderful if you're *ahead* of it. Our business is to help keep you there. That's why IT PAYS TO COME TO HEALD.

HEALD

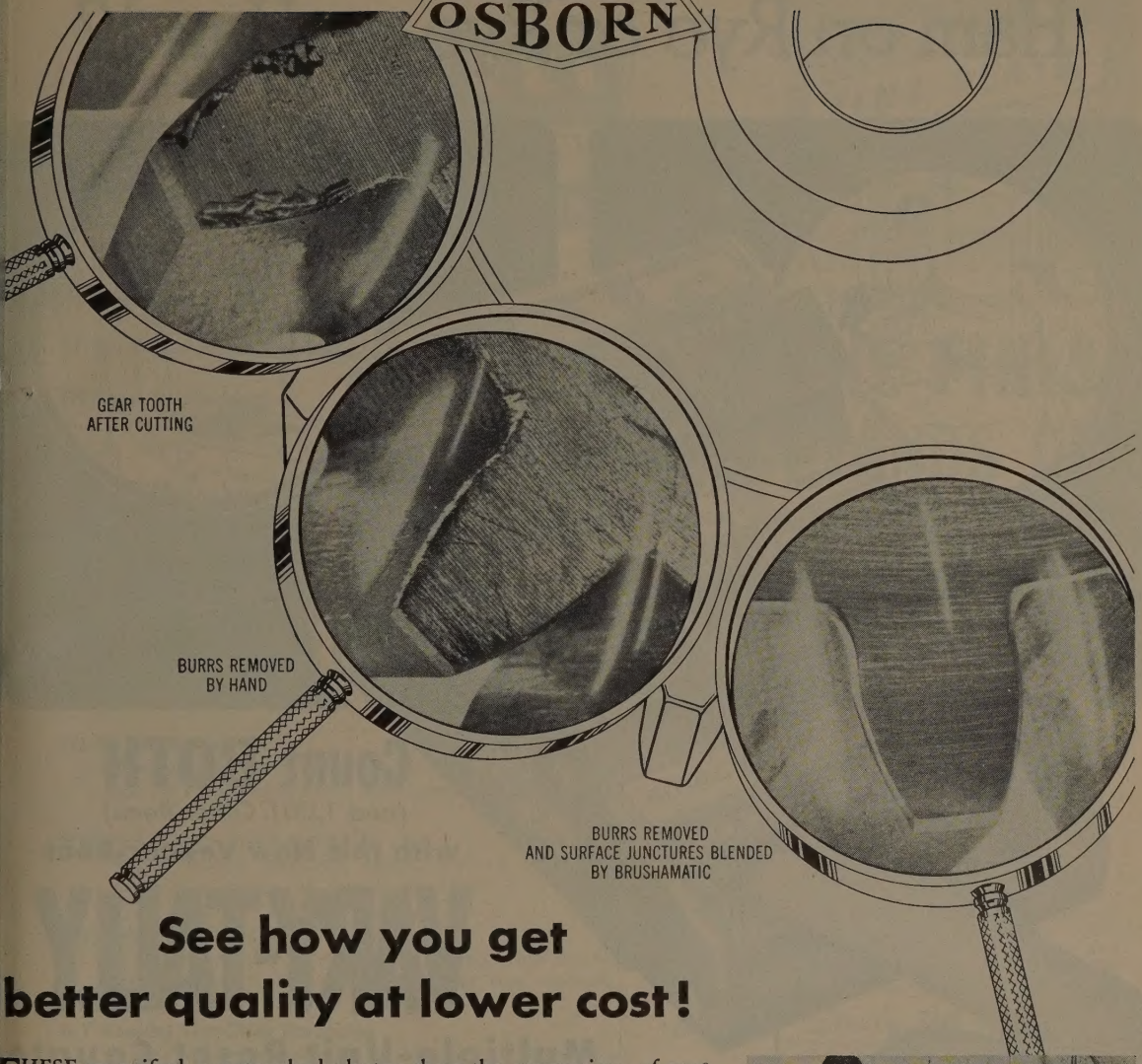
THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton
Detroit • Indianapolis • New York

Internal and Rotary Surface Grinding Machines and Bore-Matic

OSBORN



See how you get better quality at lower cost!

THESE magnified, unretouched photos show the comparison of gear teeth surfaces when burrs are removed by hand and when burr removal *nd blending* is done by the Osborn *Brushamatic.** The blended surface ıncture*s* have no scratches to concentrate stresses. Their uniformity and moothness mean superior performance and greater life expectancy.

You not only get *greater quality* when you remove burrs and blend with ıe *Brushamatic*... This push-button method *boosts output* per manhour s much as 5 to 10 times. Scrap loss is nil. It saves floor space and it is eat and clean.

The **O**sborn **B**rushing **A**nalyst will gladly help you find out how you an improve your products and cut costs with this new technique. Call our **OBA** today or write *The Osborn Manufacturing Company, Dept. G-17, 401 Hamilton Avenue, Cleveland 14, Ohio.*

NFORMATION: *Write today for your copies of Booklets on Automatic Deburring and ı Brushamatic Machines.*

Trade-Mark

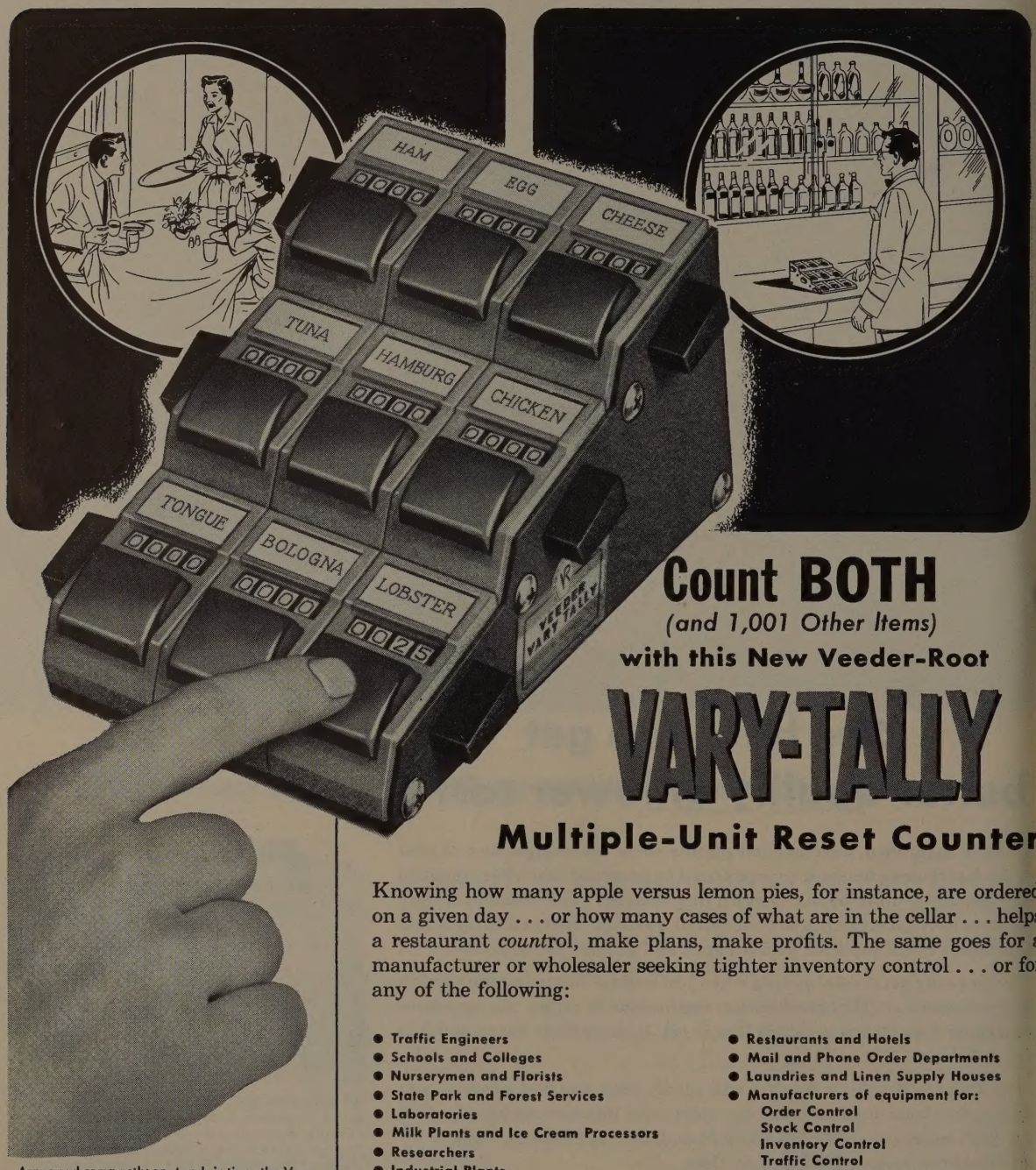
20 times as fast. *Here, the Osborn Brushamatic removes burrs and blends counter balance bearings for aircraft engine. With former method, output was 6 parts per hour. Present Brushamatic rate is 120 parts per hour. Results are perfectly uniform . . . piece after piece.*

See the *Brushamatic* in operation at the ASTE Show, Booth 627.

Osborn Brushamatic

BETTER QUALITY . . . LOWER COSTS . . . AT THE PUSH OF A BUTTON

Ham on Rye or Rye on Hand?



Count BOTH

(and 1,001 Other Items)

with this New Veeder-Root

VARY-TALLY

Multiple-Unit Reset Counter

Knowing how many apple versus lemon pies, for instance, are ordered on a given day . . . or how many cases of what are in the cellar . . . helps a restaurant *count*rol, make plans, make profits. The same goes for a manufacturer or wholesaler seeking tighter inventory control . . . or for any of the following:

- Traffic Engineers
- Schools and Colleges
- Nurserymen and Florists
- State Park and Forest Services
- Laboratories
- Milk Plants and Ice Cream Processors
- Researchers
- Industrial Plants
- Textile Mills
- Inspection and Quality Control
- Jobbers, Wholesalers, Distributors
- Restaurants and Hotels
- Mail and Phone Order Departments
- Laundries and Linen Supply Houses
- Manufacturers of equipment for:
  - Order Control
  - Stock Control
  - Inventory Control
  - Traffic Control
  - Sales and Market Analysis
  - Laboratory Analysis
  - Payroll Preparation
- and What Do You Want to Count?

Arranged compactly on stands in tiers, the Vary-Tally can be supplied in any of 66 combinations, up to 6 banks high and 12 units wide, with a minimum of 2 units wide. Write for news sheet and prices.

"The Name that Counts"

VEEDER-ROOT INC.

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Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C. • Montreal 2, Canada • Dundee, Scotland • Offices and Agents in Principal Cities

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING
Vol. 134 No. 11 March 15, 1954

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NICKEL TIN CADMIUM
ZINC PLATE and Luster-on®
CHROME COPPER

Study ALL angles and

ONE FINISH STANDS OUT

Study METAL COST

ZINC is the cheapest metal to plate. Even with LUSTER-ON Passivating Dip added it still COSTS LESS than Cadmium, Copper, Nickel and Chrome or any other finish that we know of today.

Study TIME COST

Zinc plate with simple Luster-on cold dip treatment will usually SAVE 2/3 of the PROCESSING TIME of flash copper, nickel and chrome work. TIME COSTS YOU MONEY — SAVE IT WITH LUSTER-ON.

Study POWER COST

Zinc plate and Luster-on require no heavy power to plate or heat metals such as nickel and chrome. YOU SAVE ON POWER USED and RECTIFIER or GENERATOR EQUIPMENT REQUIRED.

Study THE FINISH

Zinc and Luster-on, applied manually or in full automatics, can nowadays show finishes so beautiful, so gleaming that they bow to no one. Proved again and again superior to cadmium for most purposes, they rival traditional chrome.

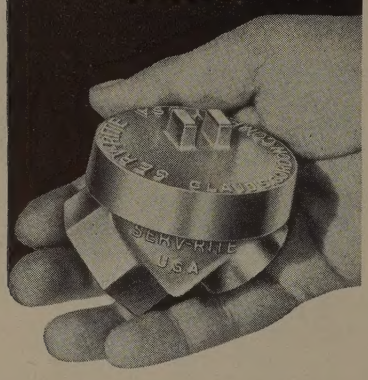
Study ALL ANGLES

You'll soon see why big companies and job shops alike agree that Zinc and Luster-on is here to stay — has established itself over the years, not just as a substitute for scarce metals. BUT BE SURE THE PASSIVATING DIP YOU USE IS GENUINE Luster-on — "The first in the field and still the leader."

Write for free data sheets and send a part for free processing.

THE Chemical CORPORATION
56 Waltham Ave., Springfield 9, Mass.

"SERV-RITE"
THERMOCOUPLE
HEAD



the head that's ahead in every way . . .

This new "Serv-Rite" thermocouple head is actually small enough to be held comfortably in the palm of your hand. But size is only one of the many features that make this thermocouple head really extraordinary. It is loaded with installation and service conveniences that any user of thermocouples will appreciate at once.

The body is of malleable iron, cadmium plated for durability. A new type friction lock assures easy removal or tightening of the cap — a quarter turn does it. An asbestos gasket makes the head dirt- and moisture-proof. With a choice of ½", ¾", or 1" IPS opening for the protecting tube, you can standardize on one style head.

The connector block is of a material especially selected to withstand, without damage, temperatures up to 900° F. in continuous service. Improvements over the conventional type of inserts greatly simplify the making of the lead wire connections. The complete thermocouple element, including connector block, can be easily withdrawn for inspection.

Install a "Serv-Rite" thermocouple head and see for yourself how much better it really is.

Write for complete details

4421

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behind the scenes

Be Our Guests

We're up to here in snow today and if our copy seems a bit frostbitten, it's because we and our little ole typewriter are sitting smack in the middle of Cleveland's second blizzard in three days.

When you get around to reading this cool piece, March will probably have had its lion's mane trimmed into an attractive Italian hair-do. Right now, however, we've got an S.O.S. out for Clyde Beatty in the hope that he can get this crazy cat under control.

Now that I've gotten off on this weather tangent, let me remind you that, despite the snow, it's not too early to be giving some thought to the ASTE Show scheduled for the week of April 26. Philadelphia is the site this year and, whether or not you intend to be there, we suggest that you take a good, long look at STEEL's April 19 show issue.

For those of you who plan to attend the Show, STEEL will have valuable previews of things to see while you are there. If you can't be in Philly that week, please be our guests and see the ASTE Exposition through the eyes of our editors.

We plan to bring you full coverage of the exhibits . . . a schedule of all meetings . . . solid technical coverage of tooling and production problems . . . an interesting story of the new role of the tool engineer . . . and all the regular departments and full metalworking news coverage.

Advance to Hard Selling

Did you see a copy of the recent letter by Mr. George O. Hays, president of the Penton Publishing Co., in which he pointed up the fact that "It's time to *advance* to hard selling."

We got a particular boot out of the good common sense in Mr. Hays' message and thought we might pass along a point or two. His opening paragraph stated that we've all been hearing a lot about the need for going *back* to hard selling, and we have. Where he differs with most adherents of the back-to-hard-selling theory is that "in this fast moving, intensely competitive year, going *back* to anything is not good enough."

"Yesterday's methods," he says, "were geared to yesterday's market. To keep pace with the 1954 market calls for lifting our sights to a new American economy each year . . . one that each year is adding the equivalent of another Philadelphia to the U. S. population total."

"Such conditions," continues Mr. Hays, "can be met only by *advancing* to a new concept of hard selling."

"Amen," says Shrdlu. And you know what, this is the kind of good, practical, yet visionary thinking that we would agree with even if it wasn't our boss who had said it.

Puzzle to End Puzzles

"It's beyond my comprehension," writes Mr. V. O. Johnstone, vice president and sales manager of the Toledo Steel Tube Company, "where this problem came from. But just so long as you don't ask me the answer, you're welcome to try it out on your readers."

Which is exactly what we will do, tout de suite.

"A cross-eyed woodpecker with a cork leg and a synthetic rubber bill required one-half hour to peck one-fourth of the distance through a cypress log fifty-three years old. Shingles cost seventy-nine cents per hundred-weight and weigh eight pounds apiece. The log being pecked upon is thirty-four feet long and weighs forty-six pounds per foot. Assuming that the coefficient of friction between the woodpecker's bill and the cypress log is ninety-seven ten thousandths and that there is negligible resistance to diffusion, how many units of vitamin "B" will the woodpecker require in pecking out enough shingles for a seven-thousand five-hundred dollar barn, with a detachable chicken house? The woodpecker has an efficiency of ninety-seven per cent and gets time and a half for overtime.

We dare anyone to come up with an answer to that one.

Shrdlu

(Metalworking Outlook—Page 49)

Sure **BEEF STEW** *is good ...*

But sometimes you want **ROAST BEEF**

T'S THE SAME WITH STAINLESS STEEL

During the years that chromium-nickel grades of Allegheny Metal were restricted to essential uses under priorities, we made great strides in the development of alternate stainless grades.

These alternate grades are *good,* mind you! In most cases, you'd never know the difference in looks or performance; and in many cases there's little or no difference in fabricating methods, and a possible advantage in cost. Without doubt, they'll continue to be used in hundreds of applications.

But there are other hundreds of uses where only a chromium-nickel grade of Allegheny Metal will do the job *best* . . . because of unusual strength requirements, perhaps—or the need for exceptional corrosion resistance or for non-magnetic properties, special fabricating qualities, etc.

Now that all alloy materials have been freed from controls, we can produce *any* grade of stainless steel you may require; and as always, in any shape or form. ● Give yourself a competitive edge with Allegheny Metal . . . and let us help you determine the grade that exactly fills the bill. *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

W&D 49208

You can make it **BETTER** with

Allegheny Metal

Warehouse stocks carried by all Ryerson plants

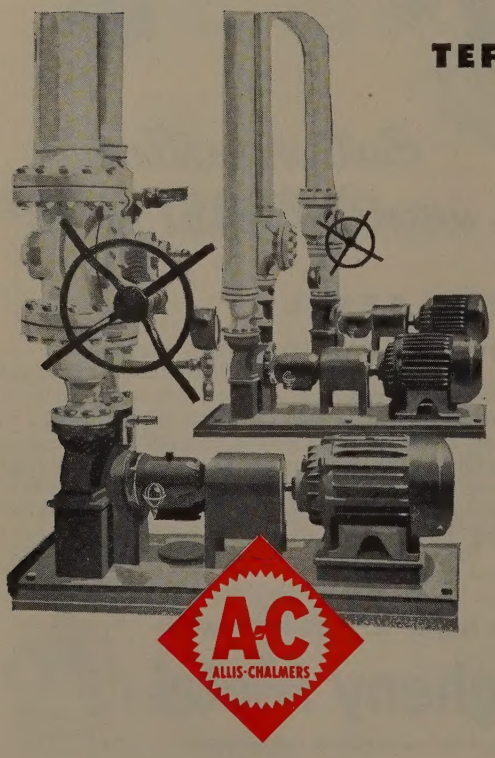
AL® TIME-TESTED STAINLESS STEEL

new motors - new

OPEN — DRIP-PROOF

Here are a few of the reasons why the new Allis-Chalmers open—drip-proof motor in NEMA rerate sizes will give you better performance and lower maintenance costs in general-purpose applications.

- Better protection against falling water and debris because cooling air inlets are on bottom.
- Long bearing life because large grease chambers provide plenty of reserve lubricant and are thoroughly sealed against foreign matter.
- Quieter operation, smoother performance.



TEFC and EXPLOSION-PROOF

For especially dirty, corrosive or hazardous applications, you will get top performance with low maintenance costs from the new Allis-Chalmers totally-enclosed, fan-cooled and explosion-proof motors in NEMA rerate sizes. Here are a few of the reasons:

- Foreign matter kept out of bearings and motor interior by double labyrinth seals inside and outside of bearings, and long running fits between shaft and seals.
- Bearing maintenance reduced because large grease chambers provide space for reserve lubricant; also, if required, grease may be renewed without dismantling.
- Easy to clean — no inaccessible air passages. Dirt wipes or blows off easily.

ALLIS

GET COMPLETE INFORMATION NOW

Allis-Chalmers, Milwaukee 1, Wis.

Send for these bulletins:

- ☐ Open — Drip-Proof, Type G, 51B6210
- ☐ TEFC, Type GZ, 51B7225
- ☐ Explosion-Proof, Type GZZ, 51B7286

Name _____

Company _____

Position _____

Address _____

City and State _____

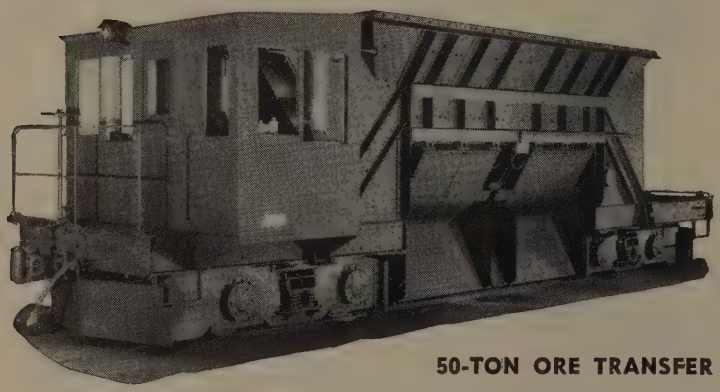
A-4280

CHALMERS

On the HIGHLINE

It's ATLAS ORE TRANSFERS

It's Atlas Transfers for dependable, year-in, year-out service . . . for operator safety and convenience which approaches semi-automatic service.



50-TON ORE TRANSFER

This Atlas Ore Transfer is equipped with modern hydraulically-operated discharge gates and brakes. Steel plate trucks are provided. The cab is overhung at one side to give the operator a line of vision alongside the car. The car is equipped with electric space heaters.

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS TO THE EDITORS

Selling Requires Effort

We would very much appreciate re ceiving five reprints of the first STEEL's Program for Management serie for 1954, "Now You Have To Sell (Feb. 22, p. 91). This is an excelle article.

V. H. Spauldi
manager marketing & sales promoti
W. S. Rockwell C
Fairfield, Con

We would appreciate 15 tear sheet . . . We believe that our salesmen woul appreciate this article and it will defi nitely assist us in our present progra

Alvin Sulma
C. M. Lovsted & Co. In
Seatt

Thanks for forwarding the 200 re prints of "Now You Have To Sell. I know that all our men will be ver much interested in reading the article

J. T. Somer
presiden
Wyckoff Steel C
Pittsburg

Kindly send us two tear sheets o "Now You Have To Sell."

R. John Hes
vice presiden
Lake Erie Engineering Corp
Buffal

We would like to have 30 tea sheets . . .

R. E. Uptegraff Jr
vice presiden
R. E. Uptegraff Mfg. Co
Scottdale, Pa

We were intrigued by the article "Now You Have To Sell." If it is possible we would like to obtain about 1 tear sheets of this interesting story.

Spencer F. Holl
presiden
Allied Building Products Inc
Hopkins, Minn

I should like to have 6 tear sheets . .

C. J. Cooperride
Industrial Nucleonics Corp
Columbus, O

• *Being sent.—ED.*

Electric Furnaces Cheaper?

Have read your article "Costs Favo Electrics in Cold Metal Shops" (Jan. 25, p. 96).

The process of electric arc furnace steel is generally understood as being more expensive than other proved processes and the article proves very enlightening and interesting. I would like to know where four copies of the entire paper from which your story was condensed can be obtained.

J. E. Roark
Steel Division
Phoenix Mfg. Co.
Joliet, Ill.

• *Copies of that paper should be requested from the American Iron & Steel Institute, New York.—ED.*

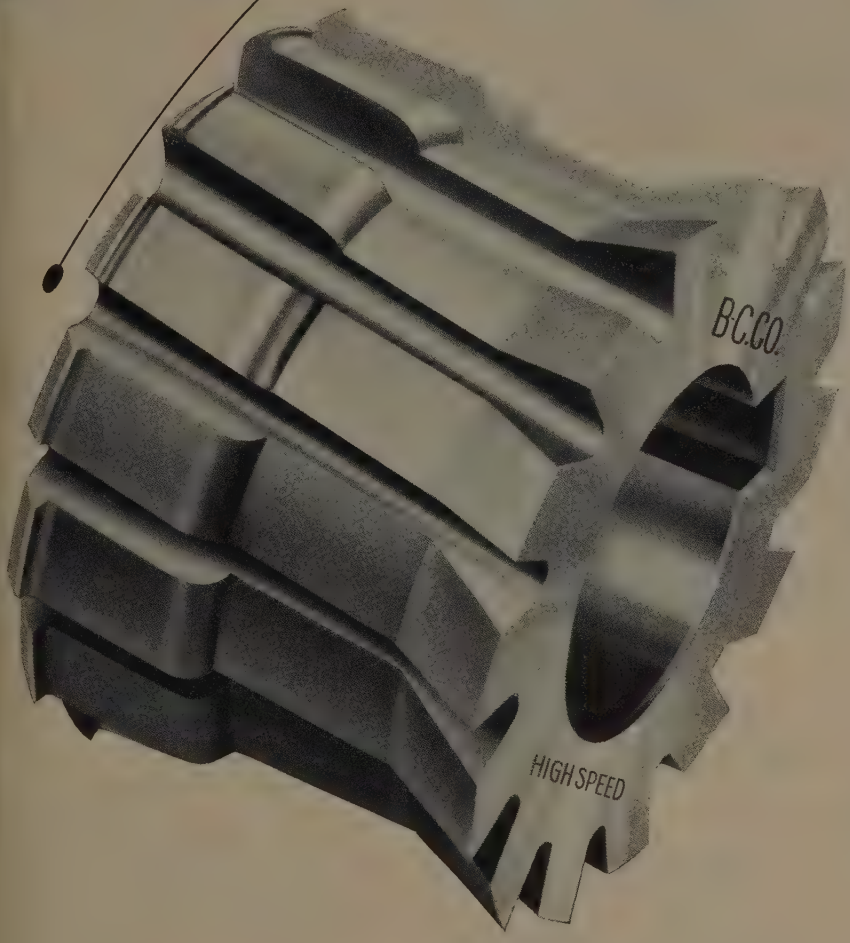
Cold Extrusion Examined

I represent a group of students who are making a study of cold extrusion processes in connection with a thesis for a course in the Harvard Graduate School of Business Administration. Our

Please turn to p. 12

Barber-Colman

FORMED CUTTERS



designed for peak milling efficiency, consistent form duplication, accuracy and long cutting life

Cutters specially designed and manufactured for your form milling operations give you greater cutting efficiency, the most practical means of combining cuts, and reduced milling costs. Depending upon the accuracy you require, these cutters can be furnished with either ground or unground form.

Barber-Colman uses new manufacturing controls and production equipment to give you the most accurate, long-lived formed milling cutters available.

For your special form milling requirements, call a Barber-Colman cutter specialist. He will be glad to assist you with your particular production needs.

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Barber-Colman Company

GENERAL OFFICES AND PLANT, 833 ROCK STREET, ROCKFORD, ILLINOIS

Specialists in

milling cutters, profile or formed, ground or unground thread milling, special problems

Many of the most important firms in the country use the complete fabrication and construction facilities of the Fort Pitt Bridge organization. Our many years of practical experience with Structural Steel is available to you on any size project—any time—any where.

YOU CAN BE SURE OF ALL THESE IMPORTANT FACTORS WHEN YOU SELECT

STRUCTURAL STEEL

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General Offices: Pittsburgh, Pa.
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"THERE IS NO SUBSTITUTE FOR STRUCTURAL STEEL"

AISC — American Institute of Steel Construction Inc. — Founded 1921

"STEEL PERMITS STREAMLINING CONSTRUCTION WITH SAFETY, ENDURANCE AND ECONOMY"

LETTERS

Concluded from p. 10

particular interest is the future significance of such processes in civilian industries.

We have the impression that this is going to prove an important metalworking field but to demonstrate it in a thesis we shall have to produce instances of specific cost savings vis a vis automatic screw machines. We would be grateful to you if you could send us information on civilian applications and costs.

John B. Stiles
Harvard Business School
Boston

• *For that information, we suggest you contact supplier firms of the phosphate coating for cold extrusion.—ED.*

No Noise, Good Noise

Your article "Reduce Plant Noise" (Mar. 1, p. 94) was very good and we all enjoyed reading it. We should like to be sure that all the members of our association and others interested in noise see it also.

Could we have your permission to have offset copies made?

Raymond C. Mayer Jr.
Raymond C. Mayer & Associates
Acoustical Materials Association
New York

• *Permission granted.—ED.*

In reference to your excellent article on the industrial noise problem, you might be interested to hear about our company which specializes exclusively in industrial noise control work.

The baffle installation illustrated in the article at John Volkert Metal Stampings Inc. (p. 96) was engineered and installed by this company.

Martin Hirschorn
Industrial Acoustics Co.
New York

Industry's Water Problem

We would appreciate receiving 50 tear sheets of your editorial "Water Problem Is Urgent" (Jan. 25, p. 43).

Ralph C. Knight
director of sales
Niagara Blower Co.
New York

• *Sent.—ED.*

Further Need for Guide

We have recently seen your "Guide For Selecting Tool Steels & Carbides." We have used other directories of tool steels, which give the analyses, but they are not as complete and in such detail as yours. We would like to get about 15 copies.

C. F. Hawkridge
Hawkridge Brothers Co.
Boston

• *Copies of that guide are available at $1.00 per copy.—ED.*

Magnesium Rod Protection

We have, from time to time, heard of the use of magnesium rods as a protection against corrosion. It is our desire to obtain scientific data regarding this use. Will you refer us to the proper source?

R. Hewitt
Green's Stove & Furnace Ltd.
Winnipeg, Man.

• *We suggest you write to the Magnesium Department, Dow Chemical Co., Midland, Mich.—ED.*

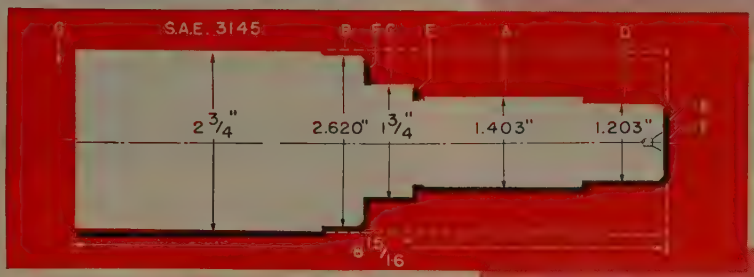
This is the difference High Velocity Turning makes

this job took...

12.40 min.

FLOOR TO FLOOR

A. Turn 489 RPM — .011 feed
B. Turn 340 RPM — .022 feed
C. Turn 489 RPM — .011 feed
D. Turn 489 RPM — .011 feed
E. Face end, shoulders & neck 489 RPM — .0055 feed
Chamfer
F. Center drill
G. Cut off 82 RPM — .0035 feed H.S.S.



IN 1954 this same job takes...

5.40 min.

FLOOR TO FLOOR

A. Turn 694 RPM — .022 feed
B. Turn 694 RPM — .022 feed
C. Turn 694 RPM — .022 feed
D. Turn 694 RPM — .022 feed
E. Face end, shoulders and neck — 694 RPM — .055 feed
Chamfer
F. Center drill
G. Cut off 489 RPM — .0025 feed

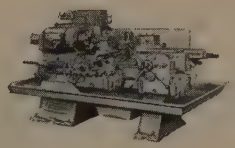
J & L TURRET LATHES GIVE...

MORE Ease of Operation
MORE Power Transmission
MORE Rigidity
MORE Accurate Stops
MORE Efficient Lubrication
MORE Coolant on Cutting Tools
MORE Accurate Results

Visitors who attend J &L's periodic "Production Studies" Seminars see this job turned out in just 5.40 min. on a Jones & Lamson #7A Universal Turret Lathe.

Only with lathes like this, built with plenty of power and the beef to back it up, can your shop take full advantage of the quality, productivity and lower costs offered by High Velocity Turning.

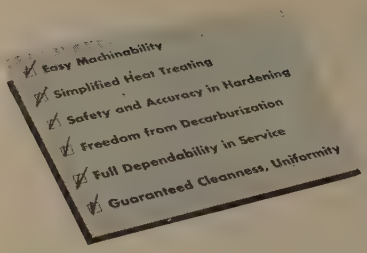
This job is one of the many turned at high speeds on our production line. Come to Springfield and see for yourself. At any rate, send for catalogs #101-A and #102.



JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., 517 Clinton St., Dept. 710, Springfield, Vt., U.S.A. J&L® MACHINE TOOL DIV.

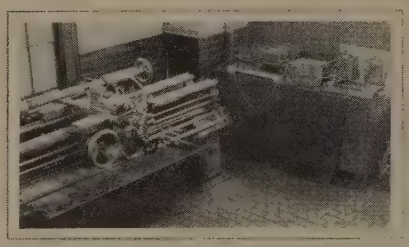


Now . . . Picture these Advantages

Make this *3-Minute Check* . . . Discover what has been put into a *dependable* die steel to help you get better die performance, lower costs!

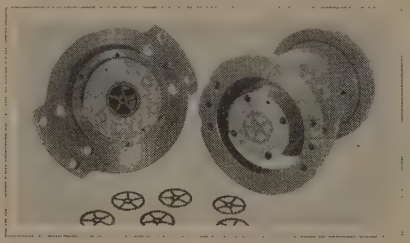
Improving existing die steels and developing new ones to meet the need for lower production costs, has been a challenge met by Carpenter. The results are modern die steels that heat treat and machine easier to save time and

Here is what *Stentor* gives you . . .



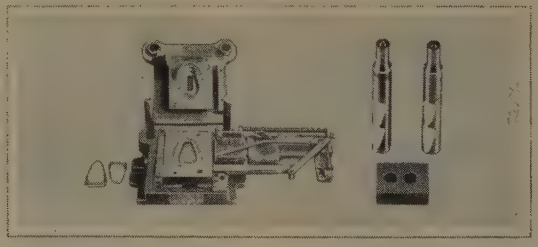
Easy Machinability. Two steels were put through this machining test. One, a well-known oil-hardening tool steel; the other, *Stentor* with its simplified analysis. Bars tested were 3½" rd. with same Brinell hardness and structure. Result: With a cut .020" deep, *Stentor* proved to be 11% easier to machine than the other steel.

Simplified Heat Treating. Because of *Stentor's* simplified analysis, it hardens from the low temperature of 1420° to 1450°F. This low temperature reduces dangers of size change and decarburization —holds warpage to an absolute minimum.



Safety and Accuracy in Hardening. This punch and die blanks 1.342" dia. timing mechanism gears having 120 teeth/90 pitch, made from 24 ga. ¾-hard brass. Customer reports: "In heat treatment the *Stentor* die moved only .0005" on the max. dia. of the gear!"

Freedom from Decarburization. Here is a *Stentor* part as quenched and before drawing, showing absence of soft skin. This test proves that *Stentor* tools when properly hardened are hard enough, right on the surface, to scratch glass!



Full Dependability in Service. Here are just two examples of the job *Stentor* does day after day in service. Die on left gave *83 continuous* hours of production between grinds compared to *10 hours* with a chrome-tungsten grade! The ¼" dia. punches shown to right above punch ¼" thick SAE 1020 steel. After *Stentor* was used production went up 160%.

GET IMMEDIATE DELIVERY . . . Call your Carpenter Mill-Branch Warehouse, Office or Distributor.

If you are not getting *all* of these advantages from the steel you use, you're missing a big opportunity to cut costs, raise output!

or YOUR Tools and Dies!

oney; run longer between grinds to reduce unit costs. Here are facts about *entor* (Oil-Hard) Die Steel—one of 12 modern steels in Carpenter's well-own Matched Set. Check what *Stentor* offers . . . compare it point by point th the die steel you now use. We believe you'll agree: Here is a real opportunity to put your tooling ahead of competition, take a big step to high uantity output at reduced unit costs.

In the next 180 seconds you can prove to yourself how a Dependable die steel can give you Definite Savings in diemaking and on the job!

COMPARE it with the die steel you use . . .

Does the steel you use provide this extra economy in machining?

m job after job, *Stentor's* simplified analysis, free of hard-to-achine alloys, has proved it can save plants as much as *10c* on *very* dollar spent machining tools and dies!

Is the steel you use as easy and uncomplicated to harden as this?

Without preheating, you place the cold *Stentor* tool right in the hot furnace and let it heat "naturally" until it reaches furnace temperature. Soak an additional 5 minutes per in. of thickness, then quench in oil. This saves time, trouble—it is the *safest* procedure—and it gives you better tools.

Will the oil-hardening steel you are using behave in hardening like this?

A test specimen of *Stentor* 1" lg. expands only about .001" when hardened, but upon drawing between 300/400°F, it returns to within about .0004" of original length!

Is the steel you use subject to troublesome surface decarburization?

Discover what real freedom from decarburization can mean. On one job, involving a chrome-tungsten grade for blanking delicate .0063" ga. aluminum pointers, considerable trouble was encountered because of surface decarb. With *Stentor's* full-hard surface after hardening, the job is now produced in quantity, at a profit.

Can you be sure of full dependability, freedom from worry, when you put your oil-hardening dies in service?

Stentor's cleanness and uniformity is checked by 100% hot acid etch and its excellent combination of hardness and toughness gives you full assurance of dependable, worry-free output.

change to Carpenter STEEL

Matched Tool and Die Steels

the standard tool steels of industry

. . . *modern* die steels engineered to meet *today's* requirements!

THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Company, Fort Washington, N. Y.—"CARSTEELCO."

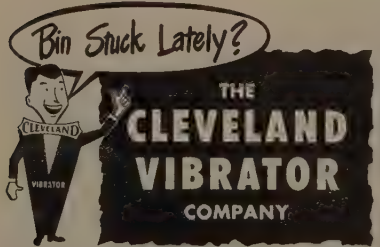
The case of the hesitant sand...

Yes, a New England foundry really did have a case like this. As the sand started down through the overhead bins and hoppers, it paused uncertainly, sort of reared back and held up production something terrible.

Fortunately, the foundry superintendent called us for advice. In short order a battery of CLEVELAND vibrators were installed on the bins, and the sand hasn't hesitated ever since.

Whatever your hesitant material ... cement, steel chips, ore ... just tell us — or ask for our detailed literature.

AIR *and* ELECTRIC



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THE WEEKLY MAGAZINE OF METALWORKING

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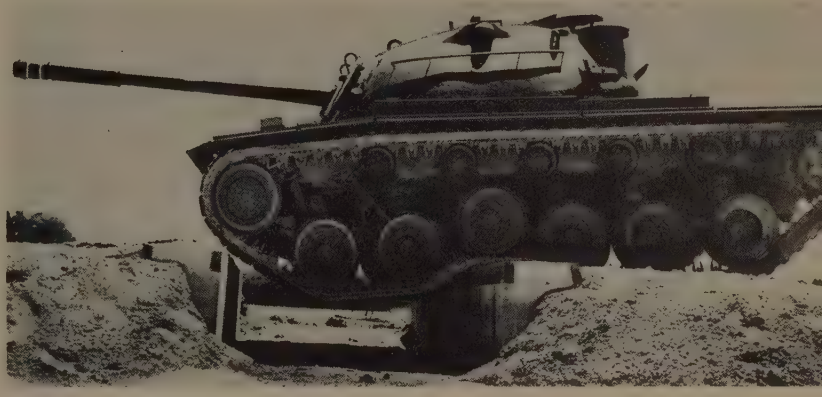
New facts for your file on USS CARILLOY STEELS

Improved suspension system of "Patton 48" features torsion bars of Carilloy steel



In the army's newest medium tank, the Patton 48, torsion bars made from U·S·S Carilloy steel do a better job of cushioning riding shocks and take less mounting space than suspension systems used in World War II tanks.

In rugged field tests of the Patton 48, the torsion bars constantly flex, twist, and vibrate as the tank rumbles over trenches and scales 3-foot walls. U·S·S Carilloy 8660, a high quality electric furnace steel, performs exceptionally well in this torturous service.

U·S·S Carilloy steels are solving many tough jobs like this in both military and civilian applications. And it will pay you to look for a Carilloy steel when you need maximum strength, light weight, good corrosion resistance, or any combination of these properties in heavy-duty parts that must be small in size.

Cost cut 75% on wing flap supports with Rolled Structural T-sections of Carilloy steel

By switching from 2¼" x 3¼" alloy steel *bars* to hot-rolled T-sections of U·S·S Carilloy 4140 steel, J. C. Peacock Company and Consolidated Vultee Aircraft Corporation have reduced the cost and *improved the quality* of wing flap supports for Model 340 Convair airliners.

Flap tracks made of Carilloy T-sections not only are stronger than those formerly used, but require 4 hours less machining time and are machined with 60% less scrap loss. Finished tracks now cost only one-fourth as much as they used to.

As J. C. Peacock and Convair did, you will find exactly the alloy steel you need in U·S·S Carilloy. Carilloy steels are produced in the widest available range of analyses, sizes, forms, and heat treatments. They readily meet with the highest quality standards. If you need alloy steel of *any type* get in touch with our nearest District Sales Office.

U·S·S Carilloy steel produced in wide variety of plate, sheet, and strip

You can order flat-rolled *Carilloy steel* in anything from a razor blade strip to armor plate for a battleship. In U·S·S Carilloy, you get the widest selection of alloy steel plate, sheet, and strip that is obtainable from one producer. One source of supply makes purchasing easier, assures you consistent quality, and simplifies manufacturing problems.

Remember, too, when you buy Carilloy steels you have at your service, every day, the best metallurgical talent available. Our metallurgists have intimate knowledge of all types of alloy steels and their most economical fabrication. These men often can help you cut costs by offering practical suggestions on engineering and production.

For more information about Carilloy plate, sheet, and strip, and for free metallurgical assistance, get in touch with our nearest District Sales Office.

USS

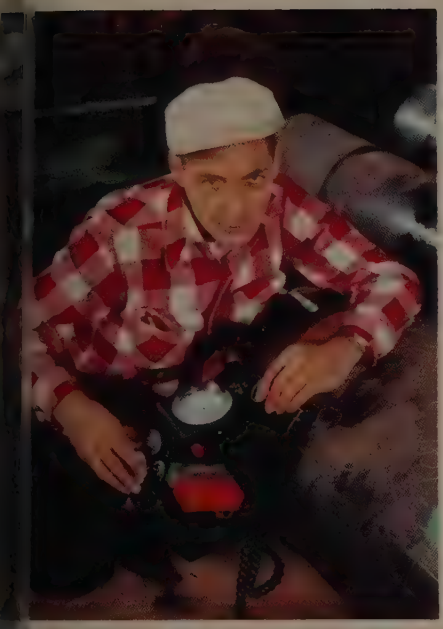
UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

"We test all our rolls

UNITED STATES STEEL

with a Penatrascope"



—says Kenneth Strang,

U. S. STEEL INSPECTOR

THIS new portable hardness tester was specifically developed to eliminate the human error in measuring steel hardness. It's so new that few people have ever seen one in action. As far as we know, we are the first manufacturer in this country to use it for testing forged steel work rolls as Kenneth Strang, U. S. Steel Inspector for eighteen years, is doing in our Homestead Forgings Division.

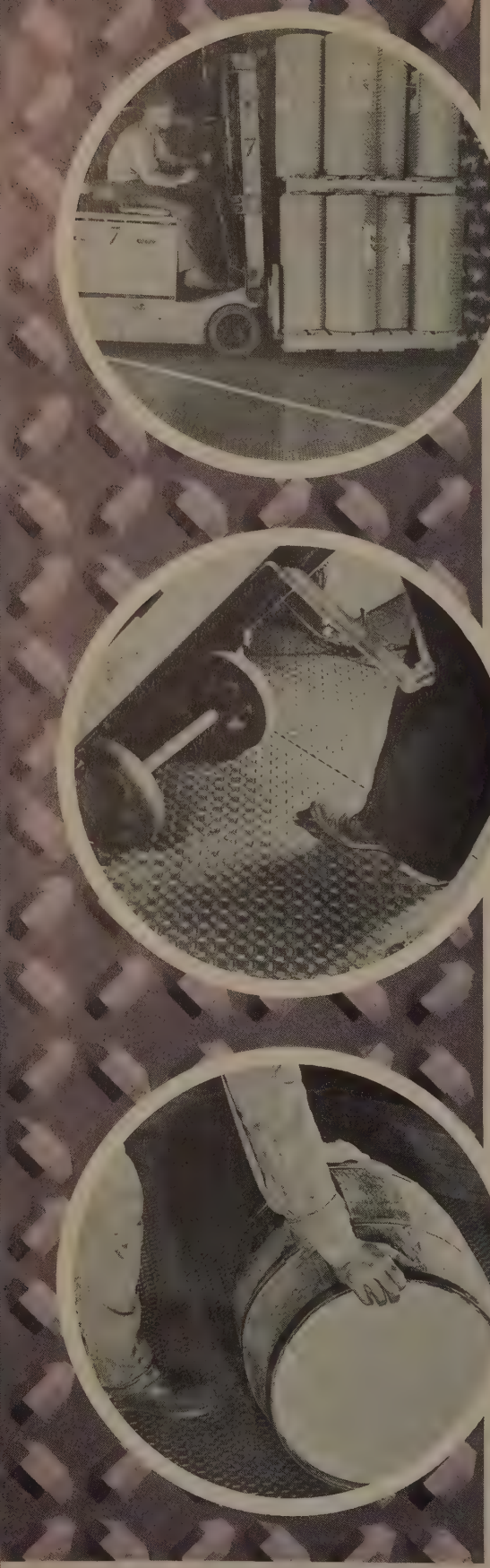
Here's how this ultraprecise instrument works. A minute diamond point is pressed into the steel under accurately controlled pressure and a calibrated microscope measures the tiny indentation. This measurement can be made to an accuracy of .001 millimeters—about forty millionths of an inch—and provides one of the most exact checks on the hardness of steel yet developed.

Why do we use an instrument of such accuracy in checking our cold reduction mill rolls? The answer is simple. The quality of these rolls is of paramount importance to mill superintendents and the men responsible for roll maintenance. Therefore, they are a premium product with us and they are treated as such in every step from the electric furnace ingot to the finished product. So, when it comes to the highly important matter of hardness, Kenneth Strang relies on the most modern instruments to obtain readings of indisputable accuracy.

We have a free 32-page booklet that describes USS Quality Forgings. It's interesting, and describes the steel, the equipment and the men who make USS Quality Forgings for you. Address United States Steel, Room 4298, 525 William Penn Place, Pittsburgh 30, Pa.

USS *Quality* **FORGINGS**

heavy machinery par
carbon, alloy, stainles
forged steel rolls and
back-up roll sleeves
electrical and
water wheel shafts
hammer bases
and columns



What can Multigrip do for you?
Protects your floor and workers too!
A tough steel plate to make floors stronger,
No more repairs and it lasts much longer.
Accident rates will fall way down,
But workers won't . . . they can "go to town":
Traction from risers protects from slip,
No protrusions on which to trip.

TWO-WAY PROTECTION. Just think of the many places in *your* plant or shop where you could assure anti-skid safety *and* long-life floor protection with USS Multigrip Floor Plate: Over the entire floor area; as stair treads and landings; on ramps, loading platforms, aisles and runways, machine footways; as trench covers over pipe lines.

All are potential danger spots for accidents, all are heavy traffic areas. Multigrip helps protect workers from falls . . . its right angle risers always assure adequate traction from any direction. And rugged Multigrip steel will protect your floors for years without requiring repairs because it can't chip, crack or rot as other flooring materials do. Multigrip can be used structurally or as covering for existing floors.

It's easy to install too. Since Multigrip comes in large sections and its pattern is symmetrical, it can be quickly installed with a minimum of cutting waste. The plate design allows quick drainage, easy cleaning.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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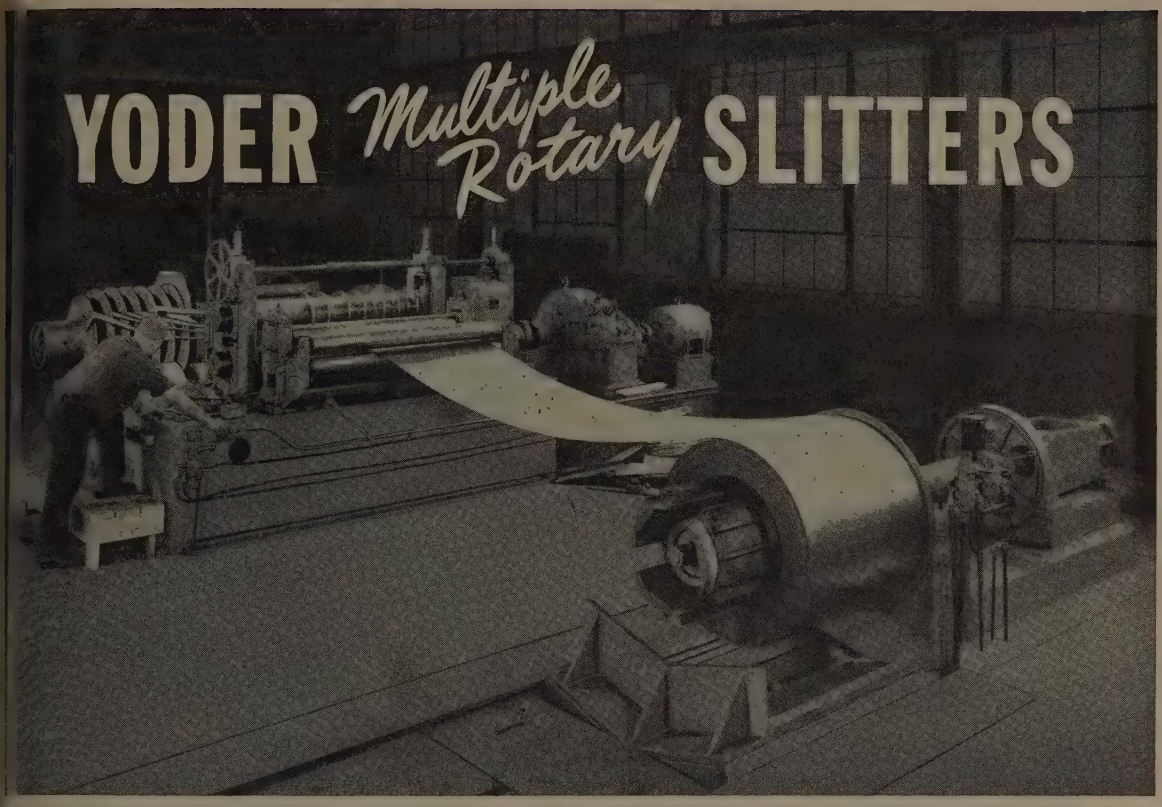
U·S·S multigrip

FLOOR PLATE

USS

Sold by leading distributors from coast to coast



pay Four Kinds of Dividends

If you use 100 tons or more of coiled strip or sheets per month, in special widths, the installation of a Yoder Slitter will pay four kinds of dividends:

1. Savings of $10 to $30 per ton by buying standard widths instead of slit strands. This saving alone often pays for the Slitter investment in a year or less.

2. You can buy standard widths competitively, wherever you can obtain the best quality, price and delivery.

3. Greatly reduced inventory requirements. From a relatively small stock of standard widths you can meet your own needs for special widths in a few hours.

4. Better control of production schedules since slitting service no longer is a problem.

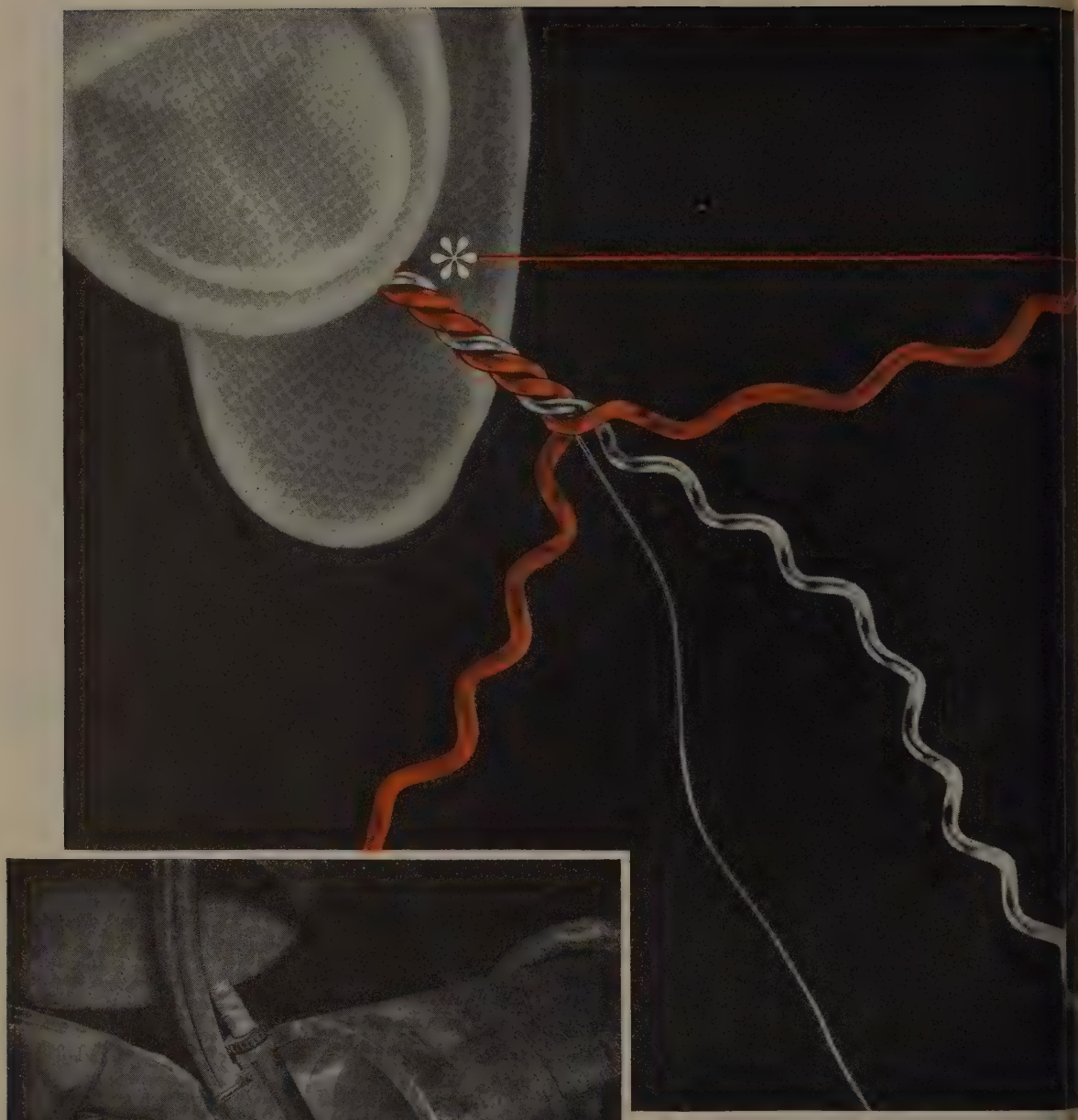
Yoder slitters, uncoilers, recoilers and other accessories are made in many sizes and capacities, from the smallest to the largest. The Yoder Slitter Book is a treatise on the economics as well as mechanics of slitter operation—send for it.

THE YODER COMPANY • 5502 Walworth Ave., Cleveland 2, Ohio

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING



The problem of depositing special alloys that are hard to draw and spool for use with the Aircomatic process is neatly answered by the use of stranded wire, an Airco development. In the wire used for these aluminum-bronze overlays, two strands of copper and one of aluminum are wound around a fine iron core. Melted by the arc, the component metals mix and alloy themselves into aluminum bronze of the correct analysis.

An overlay 1/8" thick and 2" wide being deposited in the confined area of a 10"-diameter steel cylinder. Actual welding takes about twenty minutes.

AIRCO

New Idea in Welding

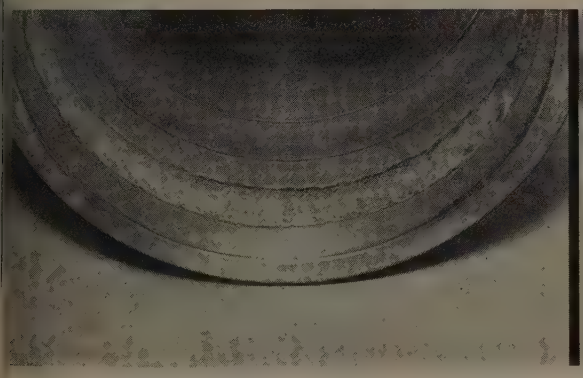
NEW STRAND-ALLOY "WIRE" DEVELOPED BY AIRCO OPENS WHOLE NEW FIELD OF APPLICATIONS FOR INERT-GAS-SHIELDED WELDING

Now, a completely new development, a stranded multi-metal filler wire, has opened the door to the welding of aluminum bronzes with the Aircomatic Process. This type of electrode is the answer where certain desirable compositions are impractical to draw down to small diameter wires and to coil on spools.

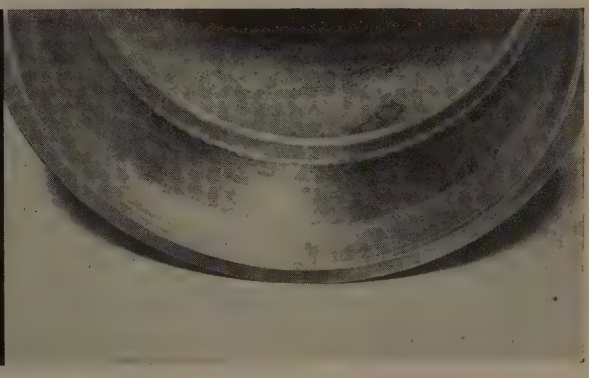
Manufacturers are using the new wire successfully, with remarkable increases in speed, ease and weld quality that Aircomatic has consistently shown in depositing more ductile materials. A typical report comes from National Rubber Machinery Company, Clifton, N. J. The National job involved aluminum-bronze overlays on piston recoil sleeves for tank guns. Before Airco introduced the new stranded wire, National Rubber Machinery had to use conventional "stick" electrodes. The new wire and Aircomatic welding cut production time to less than one-third what it was with the old method! Moreover, each sleeve took only 2½ pounds of wire, in contrast to six pounds of coated electrodes.

Airco now offers three types of stranded aluminum-bronze electrode wire, and one lead-tin-copper bearing alloy wire.

For details of this and other applications of Airco's amazingly fast and effective Aircomatic process, write your local Airco office today.



Close-up of the finished aluminum-bronze overlay before machining. Note the smooth beads and the absence of spatter.



After machining, the overlay looks like this. Aircomatic's concentrated heat input produces excellent fusion.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AN AIR REDUCTION PRODUCT

AIR REDUCTION

60 East 42nd Street • New York 17, N. Y.

Air Reduction Sales Co. • Air Reduction Magnolia Co. • Air Reduction Pacific Co.
Represented Internationally by Airco Company International
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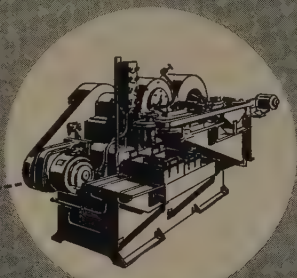
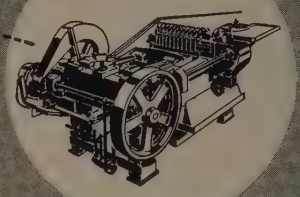
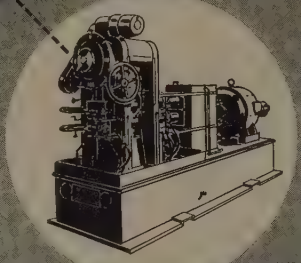
5 KINDS OF WATERBURY FARREL ANSWERS TO YOUR MASS PRODUCTION PROBLEMS



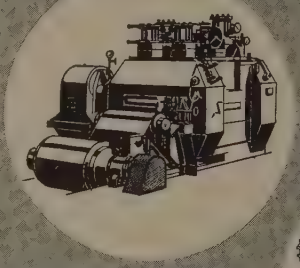
COLD PROCESS BOLT & NUT MACHINERY — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.



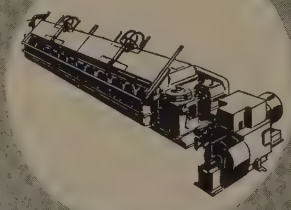
POWER PRESSES—Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.



MILL MACHINERY — Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc.



SPECIAL MACHINERY — Sendzimir Mills • Small Arm Ammunition Machines • Collapsible Tube Machines • Coining Mills, etc.



WIRE MILL EQUIPMENT — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • String-up • Machines • Spoolers, etc.

Within These Basic WF Equipment Lines, Individual Machines Are Custom-Engineered For Specific Applications

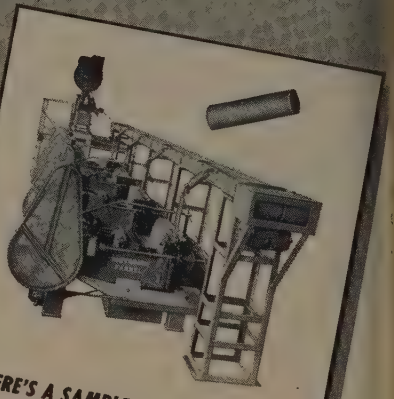
If your metal-working machinery problem falls into any of these five groups, there are good reasons for looking to Waterbury Farrel for the answer.

There's Waterbury Farrel's continuing engineering research with more than a century of machine building experience to draw upon. This results in soundly designed and thoroughly tested features which improve production.

There's Waterbury Farrel's world-wide reputation for rugged, long-lasting construction. This gives you the assurance that WF machines are built to provide long years of uninterrupted production.

Waterbury Farrel can custom-engineer special equipment or adapt a standard machine to fit your specific problem.

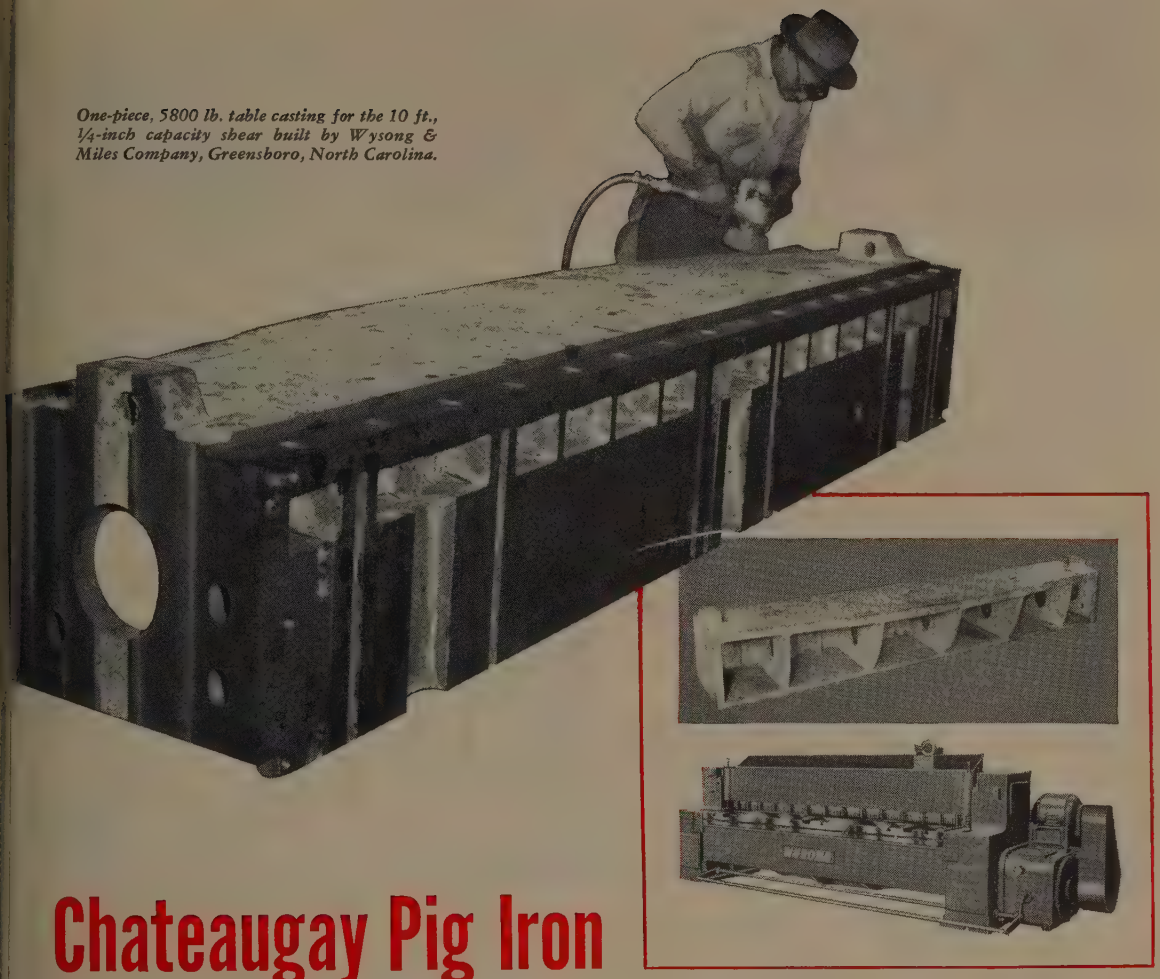
For further information, write for free booklets on any of the machines mentioned on this page or contact your nearest WF office.



HERE'S A SAMPLE of Waterbury-Farrel mass production equipment in action. This complete WF automatic production unit combines a 40-ton double-acting, upright blanking and cupping press, a conveyor feed and four 7-station horizontal drawing presses to draw 340 zinc shells per minute.

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.



One-piece, 5800 lb. table casting for the 10 ft., 1/4-inch capacity shear built by Wysong & Miles Company, Greensboro, North Carolina.

Chateaugay Pig Iron

Meets Strict Casting Requirements of Wysong and Miles

● Casting requirements on all Wysong and Miles metal-working machinery are strict. Sturdy, rigid, high-tensile castings—35,000 to 40,000 p.s.i.—are particularly important on their Model 1025 Power Squaring Shear. Strength and rigidity minimize deflection, assure correct shear alignment for a clean cut on the metal.

To meet these requirements, Wysong uses Chateaugay Pig Iron in the cupola mixture. The result is high strength, uniformity and machinability throughout every casting. This is possible despite deep recesses, cored pockets and adjoining light and heavy sections. Chateaugay shrinks evenly, fills adjoining light and heavy sections completely. It produces an unusually fine and uniform grain structure and surfaces with high wear-resistance. Chateaugay castings machine easily and economically.

A Republic Pig Iron Metallurgist will be glad to give you the complete story on Chateaugay, the low-phosphorus, copper-free Pig Iron. Let us know when you would like him to call at your plant.

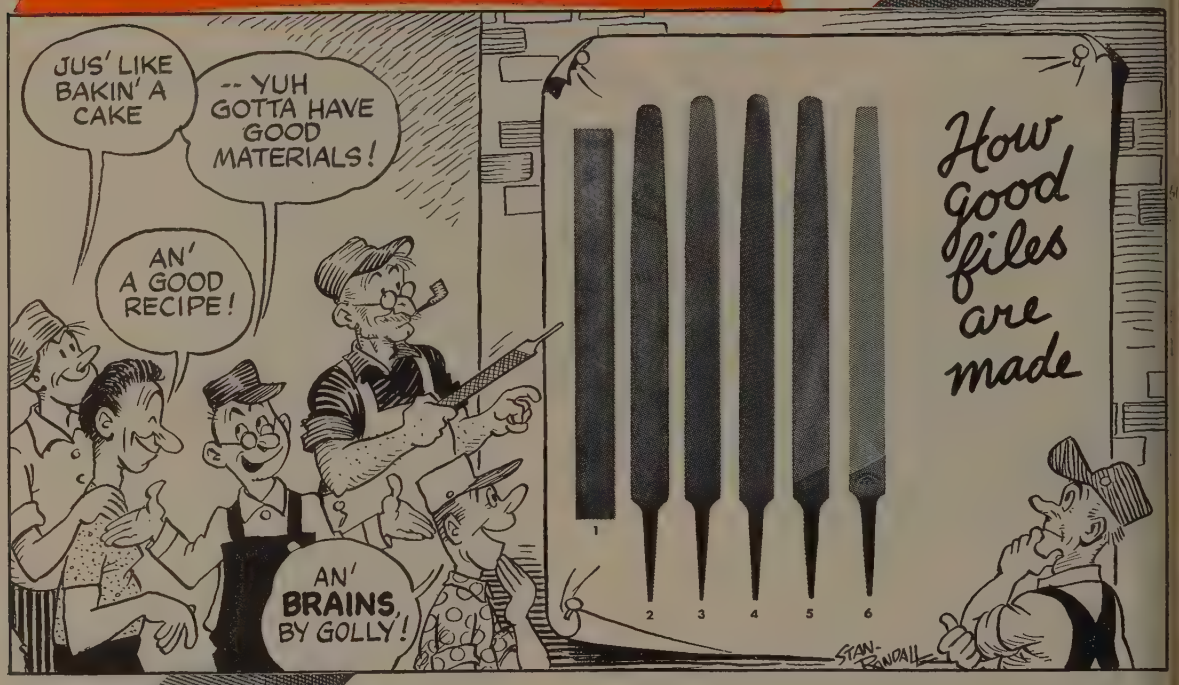
REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Building, New York 17, N.Y.

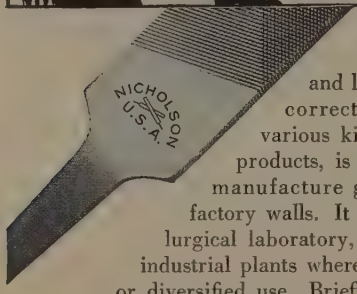
REPUBLIC PIG IRON

"CHATEAUGAY"	REPUBLIC	REPUBLIC
Low-Phosphorous, Copper-Free	(Northern) Foundry, Basic and Malleable	(Southern) Foundry and Basic

REPUBLIC STEEL

POP'S school of Filing





Making files of high and lasting quality, and of correct design for use on various kinds of materials and products, is a *science*. Nicholson manufacture goes far beyond the factory walls. It extends to the metallurgical laboratory, to the steel mills, to industrial plants where files are in constant or diversified use. Briefly, the steps embrace these important factors:

Steels are usually made to exacting specifications; come in bars of various cross-sections; are analyzed and tested; cut to working length (1).

Forging, with trip hammers, rollers and punches, shapes the body, point and tang into a "blank" (2).

Annealing, by heating that is laboratory-controlled for both degree and length, "conditions" the steel for uniform texture and for cutting.

Smoothing involves straightening the annealed blank, grinding to remove scale, and drawfiling to assure uniform teeth and even filing surface (3).

Cutting is done by Nicholson-perfected chisel-operating machines considered the most precise and efficient of their kind in the world. First operation (4) produces the overcut (single); second (5) the upcut.

Hardening is achieved under highly scientific processes and controls to assure teeth that are strong and hard yet not brittle.

Finishing (6) includes such important details as: cleaning and sandblasting for extra sharpness of teeth; softening the tang; oiling to prevent rust; final-testing and checking to assure the most efficient, uniform and long-lasting files human skill and earnestness can produce.* That's why--

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*FREE 48-PAGE BOOK, "File Filosophy," *tells lots more about the manufacture, kinds, use and care of files.*
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BLACK DIAMOND MADE IN U.S.A.

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CALENDAR
OF MEETINGS

rch 15-17, National Association of Waste Material Dealers Inc.: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

rch 15-19, National Association of Corrosion Engineers: Annual conference and exhibit, Municipal Auditorium, Kansas City, Mo. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

rch 15-19, National Association of Manufacturers: Institute on Industrial Relations, Hollywood Beach hotel, Hollywood, Fla. Association address: 14 W. 49th St., New York 20. Director, Employee Relations Division: Sybil S. Patterson.

rch 16-17, Engineering Institute on Industrial Ventilation: University of Wisconsin, Madison 6, Wis. Information: Professor Ray J. Tegtmeyer, Stadium Offices, University of Wisconsin, Madison 6, Wis.

rch 16-17, Steel Founders' Society of America: Annual meeting, Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Executive vice president: F. Kermit Donaldson.

arch 17-19, Pressed Metal Institute: Spring technical meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland. Managing director: O. B. Werntz.

arch 18-19, American Management Association: Special conference on employee group benefits, Hotel Roosevelt, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

arch 19-20, Machinery & Allied Products Institute: Fourth session, seventh conference on capital goods economics, Greenbrier hotel, White Sulphur Springs, W. Va. Information: Secretary, Charles W. Stewart, 1200 18th St. NW, Washington 6.

arch 21-23, Controllers Institute of America: Eastern spring conference, Sheraton Park hotel, Washington. Institute address: 1 E. 42nd St., New York 17. Director of public relations: G. K. Dahl.

arch 21-24, Copper and Brass Warehouse Association Inc.: 3rd Annual meeting, Hotel Greenbrier, White Sulphur Springs, W. Va. Association address: 1420 New York Ave. NW, Washington 5. Executive secretary: George W. Proffitt.

arch 23-25, Steel Shipping Container Institute Inc.: Annual meeting, Biltmore hotel, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

arch 24-26, American Power Conference: Annual meeting, Hotel Sherman, Chicago. Information: Edwin R. Whitehead, conference secretary, Illinois Institute of Technology, Technology Center, Chicago 16.

arch 24-26, Rail Steel Bar Association: Annual meeting, Hotel Jung, New Orleans. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

arch 25, National Industrial Conference Board Inc.: General session for all associates, Ambassador hotel, Los Angeles. Board Address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

larch 25-27, American Hot Dip Galvanizers Association Inc.: Annual meeting, Hotel Netherland Plaza, Cincinnati. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swenson.

larch 31-April 1, American Society of Mechanical Engineers: Management conference, Philadelphia. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

pril 2-3, National Association of Cost Accountants: Ft. Worth regional conference, Hotel Texas, Ft. Worth, Tex. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

pril 3-4, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Dennis, Atlantic City, N. J. Institute address: 342 Madison Ave., New York. Secretary: Helen L. Stratton.

NEW, IMPROVED
Instant Acting
NOX-RUST Vapor-Wrapper

NOW Wrap Out Rust INSTANTLY!

Amazing New Chemically-Active, Rust-Preventive Paper Goes to Work at Once!

Now the best product in the field has been made even better!

Here is the new, improved Vapor-Wrapper . . . an *instant acting* product far superior to any other volatile rust inhibitor on the market!

This amazing new NOX-RUST development gives instant protection to metal parts, releasing invisible chemical vapors in seconds. Also, this new instant chemical action is an addition to the normal long-range protection afforded by Vapor-Wrapper.

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Vapor-Wrapper conforms to Military Specifications MIL-P-3420. Packaging Materials, Volatile Corrosion Inhibitor Treated.

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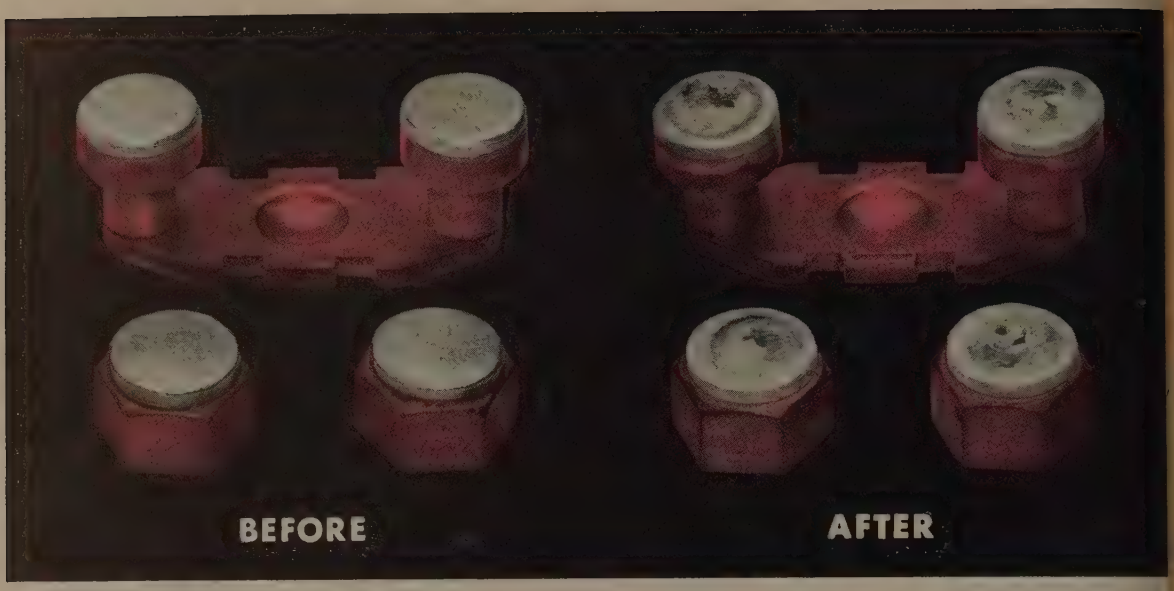


PROOF OF LOW MAINTENANCE ON CLARK TYPE "CY" STARTERS

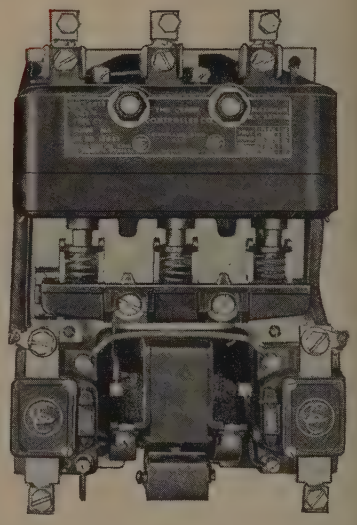
These unretouched photos show contact tips from a CLARK Bulletin 7707 contactor—the contactor used in the standard Bulletin 6013 size 2 AC Motor Starter — as they looked before and after a year of hard use.

The contactor is in service at Cleveland Hone and Manufacturing Company, on a special transformer and rectifier circuit used in processing automotive parts. The tips shown right above were removed from the contactor after 12 months of steady service, often operating as frequently as 5000 times per hour.

Note that slight discoloration and minute pitting are the only evidence of wear. They require no cleaning, dressing or filing, and are in condition to give many more years of dependable service.

The secret of long contact life in the CLARK Type "CY" Starter is its exclusive arc-quenching principle, using strong multi-turn magnetic blowouts and double-break contacts. Forced rotation causes the arc to move continually on the contact surfaces, distributing the heat and preventing pitting or "build-up" at any one point. Result: extremely effective arc interruption, and greatly reduced wear on tips.

Write for descriptive literature.



CLARK Type "CY" Starters include many more features for dependable service and reduced maintenance. Let us tell you the complete story.

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO

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Smart production men are coming, more and more, to see the business sense of American Phillips Fastening . . . pay a little more to save many times what you were paying before for old-fashioned, slip-and-slash methods of screwdriving. Find out how the *American Way* can save *you* important money. No matter what you need . . . steel, brass, stainless, aluminum or whatever . . . American has it for you *right now . . . at prices you can afford to pay.* Write:

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Bale It the G-H Way...

Salvage Your Sheet Metal Scrap At Lowest Cost-per-Ton

For many years, leaders of U. S. industry have depended upon Galland-Henning Balers and Galland-Henning Counsel for profitable solution of their sheet metal salvage problems. If your plant generates an appreciable volume of sheet metal scrap per day, chances are that a G-H Baler of proper size and capacity will prove a profitable investment for you.

Galland-Henning Hydraulic Balers are powerful, rugged and fast. They are engineered and constructed with just one thought in mind . . . to produce dense, compact, mill-sized bales at lowest possible cost-per-ton. That means profitable scrap salvaging for you, and more good, usable scrap metal for the mills, smelters and foundries.

Make Galland-Henning your Headquarters for Competent Scrap Baling Counsel.

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GALLAND-HENNING
SCRAP METAL BALING PRESSES

J&L Scrapless Nut Wire helps close production gaps

Even with the best equipment and know-how, your scrapless nut production is only as good as the wire you use.

For smooth production that makes every minute count, you can rely on J&L scrapless nut wire. Quality controlled in every phase of manufacture, J&L scrapless nut wire gives you the best in—

- SURFACE QUALITIES
- WORKABILITY
- UNIFORMITY
- FINISH

Down-time is costly—keep it to a minimum and boost your overall production of a better finished product with J&L scrapless nut wire. Remember—wherever you're located, you'll find the J&L representative near you can help show the way to fewer rejects, less die wear and less machine down-time. Call him today or write: Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pa.

Jones & Laughlin
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Super Constellation by Lockheed

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Remember the days of the "airplane ear-ache"? . . the kind caused by low cabin pressure when your plane or airliner flew above 8,000 or 10,000 feet? Well, fortunately, "airplane ear-aches" are pretty much a thing of the past now . . particularly on today's high altitude airliners.

Airlines, always alert to anything that will make passengers more comfortable, called for equipment that would keep cabin pressures normal . . so passengers wouldn't be bothered with ear-aches.

The result was the *cabin pressurization compressor* . . one of the important parts of which is a little impeller wheel. It looks simple . . but it isn't. Some of the country's better engineers spent quite a few years working on it.

Each impeller wheel, after it is machined, has to be heat treated. Engineers of AiResearch Manufacturing Company who developed the wheel (and the compressor) demanded absolutely the correct heat treatment . . for each one represented a great deal of expense, time and effort.

*It was a job for Lindberg Steel Treating Company!** Lindberg heat treating specialists determined precisely the correct method of heat treating . . the required heating temperature . . and exactly the right quenching procedure.

Aircraft inspection standards required that each wheel be inspected, not at one, not at two, not at three . . but at *four* distinct specified locations for proper hardness. No impeller wheel left the Lindberg plant without being certified by serial number. Not a single thing was taken for granted.

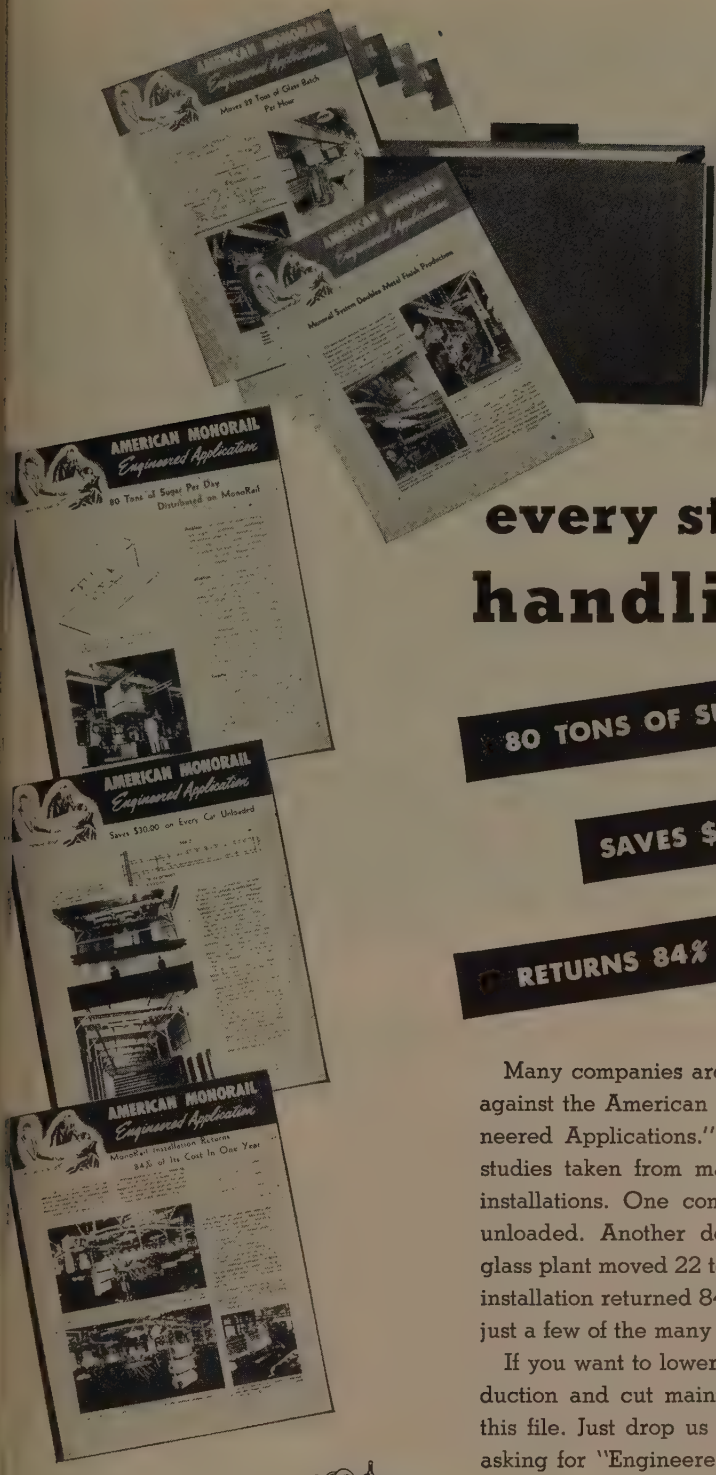
If you demand the ultimate in heat treating . . if you insist that nothing be taken for granted . . call Lindberg.

**heat treated by the Los Angeles division for AiResearch Manufacturing Company, and by the Chicago division for Masterform Tool Company, supplier to AiResearch*

A case history of Lindberg Steel Treating Co. service to American industry

LINDBERG STEEL TREATING CO.

1973 North Ruby Street, Melrose Park (Chicago), Illinois Phone: Fillmore 4-4080



every study shows a handling saving

80 TONS OF SUGAR PER DAY

SAVES $30 ON EVERY CAR UNLOADED

RETURNS 84% OF ITS COST

Many companies are checking their handling problems against the American MonoRail Case Study File of "Engineered Applications." The file contains a series of case studies taken from many successful American MonoRail installations. One company saved $30.00 on every car unloaded. Another doubled metal finish production. A glass plant moved 22 tons of glass batch per hour. Another installation returned 84% of its cost in one year. These are just a few of the many studies covered.

If you want to lower your handling costs, speed up production and cut maintenance overhead, let us send you this file. Just drop us a line on your business letterhead, asking for "Engineered Applications File F-1."

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OVERHEAD HANDLING EQUIPMENT

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By laying out your gears to be made with these tools, you can get what you need quicker . . . and cheaper

Write today on your company letterhead for a free copy of this big catalog which shows all the important specifications needed by gear designers. You'll find it convenient to use, and it will save you money on the gears you buy.

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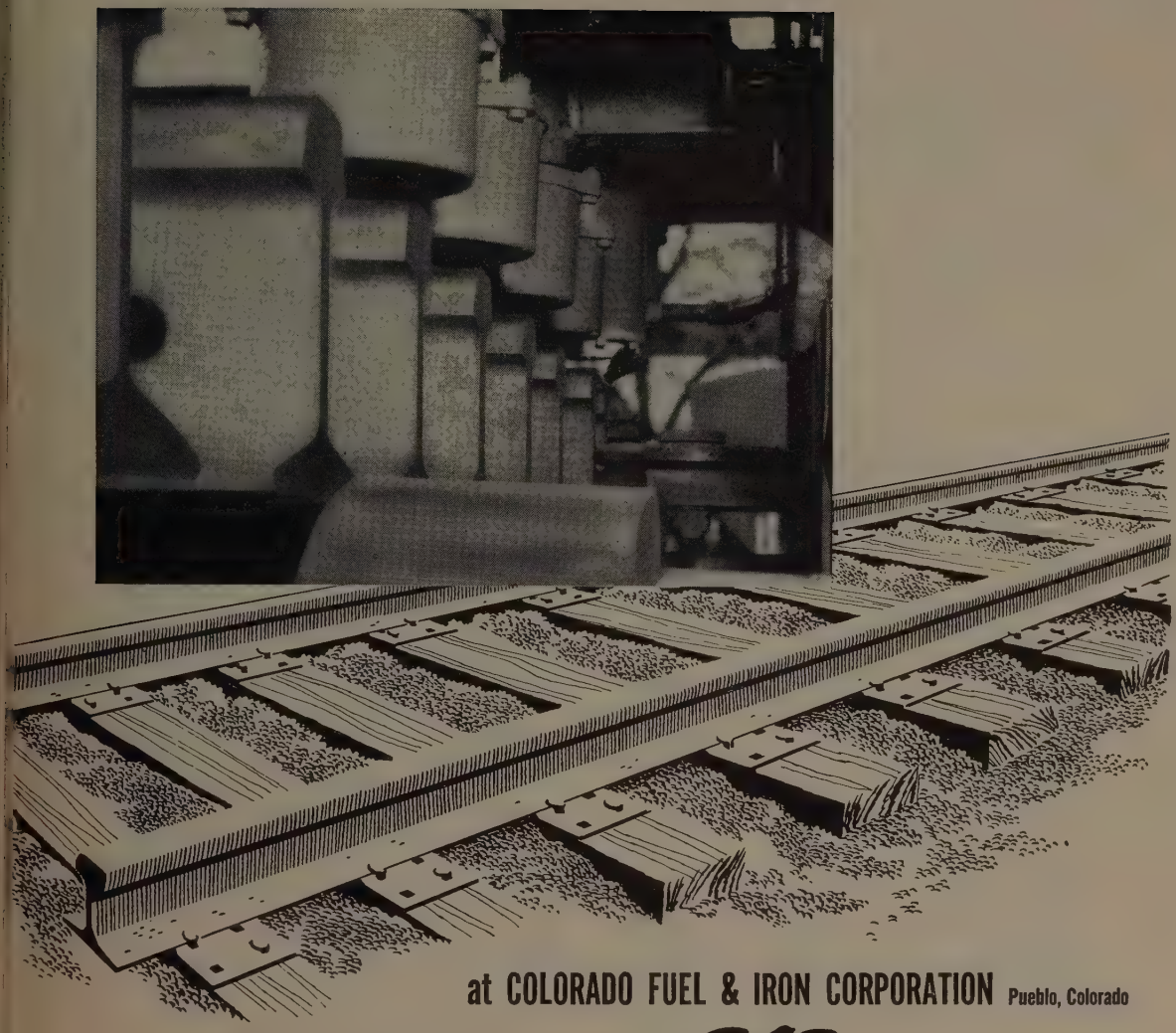

at COLORADO FUEL & IRON CORPORATION Pueblo, Colorado

high speed processing with GAS produces longer lasting rails

The essential role of GAS as a production-line tool is particularly well demonstrated in the manufacture of railroad rails at Colorado Fuel and Iron Corporation, Pueblo, Colorado.

This process involves the use of GAS-fired radiant burners, with automatic cycle-timing devices, to harden the ends of the finished rails as they move out of the mill.

First the rails are pre-heated by GAS to 1000° F. Then the ends are heated by high intensity GAS radiants which automatically bring the temperature to 1600° in 95 seconds. Finally, a cold air blast quenches and hardens the ends. This hardened area covers the entire rail width to a minimum depth of ¼″ and extends back from the end about 1½″.

High-speed heat processing with GAS results in longer rail life, lower maintenance costs, and greater safety for the railroads. The installation is one of thousands of *precision-tool* applications of GAS for exacting metallurgical requirements. If you would like further information on how GAS and Modern Gas Equipment increase efficiency, reduce costs, and improve products throughout industry, call your Gas Company Representative.

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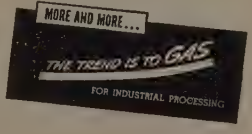


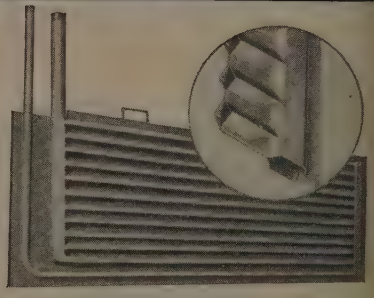
warm-up time reduced 75% as

PLATECOILS *cure coil-itis**

Burroughs Corporation has reduced warm-up time in their phosphate coating system from 2 hours to 1/2 hour by replacing original pipe coils with Platecoils. They have also saved $1,440 a year in maintenance costs as the pipe coils coated badly and required chipping at least once a month while the Platecoils have required no maintenance in over a year. In addition, the Platecoils cost less to install and take 50% less space in the tank.

PLATECOILS *replace pipe coils for 50% of the cost*

* Coil-itis is the constant doctoring of wet processing tanks for pipe coil troubles. It can be cured easily by replacing pipe coils with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster and take 50% less space in the tank. They save as much as 50% in initial cost and 50% in maintenance costs in addition to overcoming the limitations and operating difficulties of old-fashioned and outmoded pipe coils.



Bulletin P72 shows how Platecoils are replacing pipe coils at a savings throughout industry. Send today for your copy.

Platecoil Division, TRANTER MANUFACTURING, inc., Lansing 4, Michigan

For fast shipment see your local distributor

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Brown & Sharpe Permanent Magnet Chucks give you faster, dependable chucking for a wide variety of jobs. Their powerful magnetic grip engages or disengages at the turn of a lever. Strong *permanent* magnets make holding ability completely reliable . . . immune to plant power failures. And, freedom from electric wires permits using these chucks anywhere in the shop. Rectangular Models in 8 sizes from 2½"x5" to 12"x36"; Rotary Models in 5", 7" and 9" diameters. Write for catalog containing specifications on the complete line.

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. . . **Brown & Sharpe Ground Flat Stock** comes to you ready-ground to 0.001" accuracy in thickness . . . saves you time and money. In addition, careful annealing makes it easier to machine, easier on tools . . . and easier to harden.

To simplify hardening, stock is marked along entire length for quenching in "oil or water," "oil," or "water." And complete heat-treating instructions are printed on each color-coded protective envelope.

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with the Pushbutton
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H Hevi-Lift
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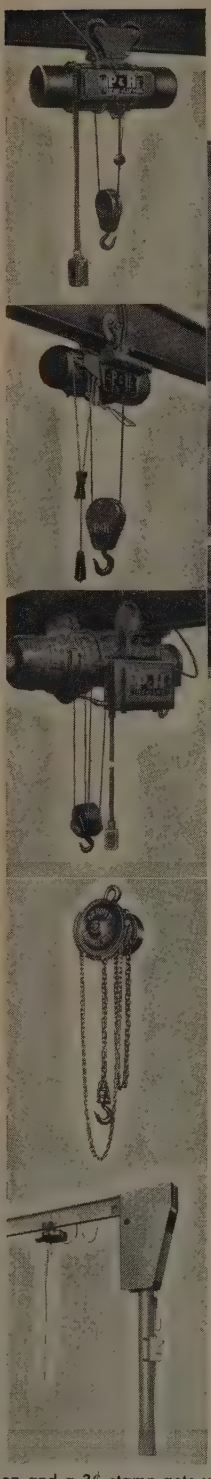

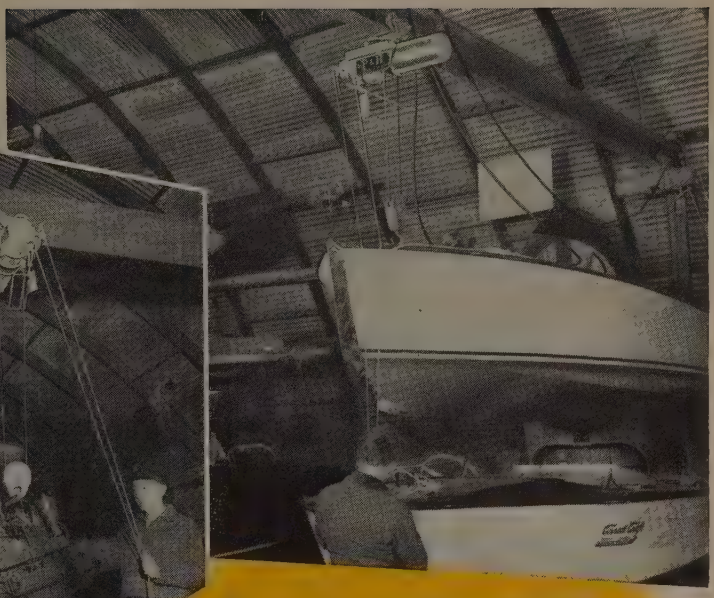

How to solve your load-handling problems *at less than 10¢ per day* with versatile, hard-working P&H HOISTS!

LET Mr. Harold Tinus, of the Tinus Marine Service in Oconomowoc, Wisconsin tell it. Says Mr. Tinus:

"In the summer of 1953, our sixth season of marine service, we were able to install two 1,000 pound capacity P&H Zip-Lift Hoists on an I-beam above the cross runway of our building, and really take advantage of their labor-saving and back-saving power, to handle customers' boats. Never again, if we can help it, will three or four men wrestle with a boat to transfer it from an outdoor trailer to an indoor cradle, when one man — simply by pulling control cords — can hoist it better than a dozen feet a minute and put it right where we want it.

"After six months of service we had a cost analysis made to determine the economics of our operation. The results amazed us. We found that for each day of operation of each P&H Hoist, our costs were only 9.7¢! That's less than the cost of a telephone call!

"That's *actual cost*. We can't attempt to evaluate the savings we've made in freeing workmen for other, skilled labor — rather than wrestling boats around our storeroom.

"And the best part of it is that by using the P&H Hoists we're able to handle more business — and the more we use our hoists — *the less they cost us!*"

This case history is just one of many, in many fields. A visit from a P&H representative can show you how you can make the same kind of savings in your business. Use the coupon below for information on the complete P&H Hoist Line.

P&H Hoists
HARNISCHFEGER CORPORATION
4411 West National Ave., Milwaukee 46, Wisconsin

Gentlemen: I'm interested in the savings I can effect with P&H Hoists. Send me more information on Mr. Tinus' experience. I'd like to know more about P&H Zip-Lift, Pushbutton Control ☐, P&H Zip-Lift, Rope Control ☐, P&H Hevi-Lift ☐, P&H Chain Hoists ☐, P&H Jib Cranes ☐.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....

This coupon and a 3¢ stamp gets you complete information on the P&H Hoist Line.

P&H HOISTS

HARNISCHFEGER CORPORATION
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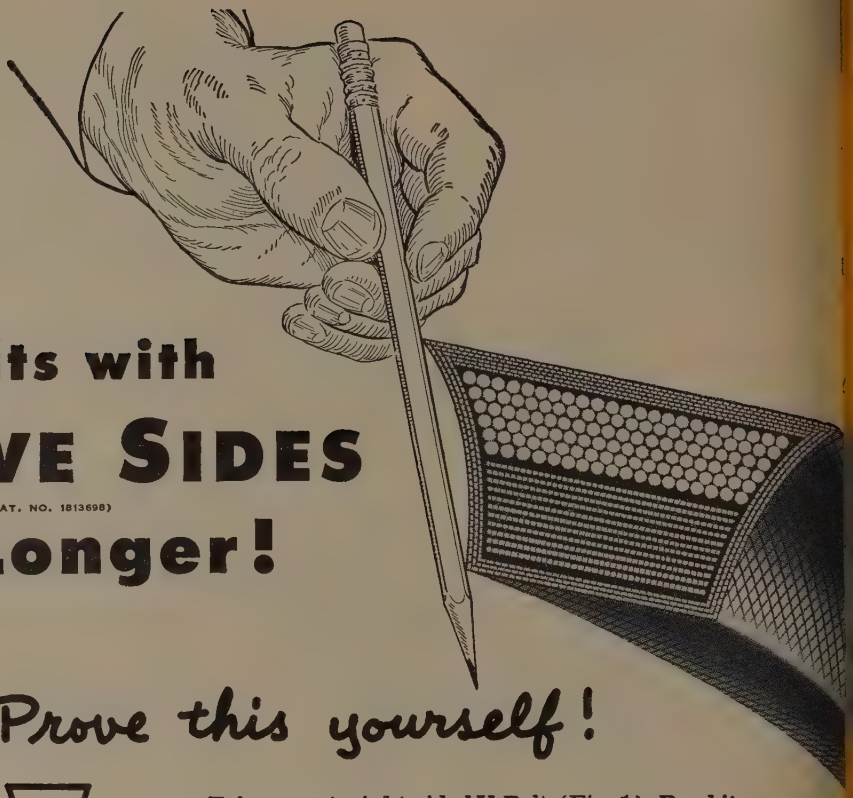
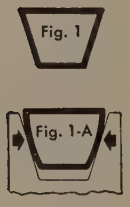


Why V-Belts with CONCAVE SIDES Last Longer!

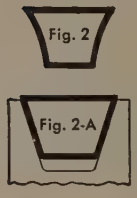
(U.S. PAT. NO. 1813698)

Prove this yourself!



Take any *straight-sided* V-Belt (Fig. 1). Bend it—as it bends in going around a pulley. The sides will at once *bulge out* (Fig. 1-A). Clearly, those bulging sides will press *unevenly* against the V-pulley—and this causes *extra wear* at the points shown by the arrows (Fig. 1-A).

Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2)



Instead of *bulging,* the precisely engineered CONCAVE SIDES merely *fill out* to *fit exactly* in the sheave groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means *longer* belt life and *lower belt costs* for you!

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE Sides—the Gates Vulco Rope!

Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

Gates VULCO ROPE DRIVES

REG. U. S. PAT. OFF.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

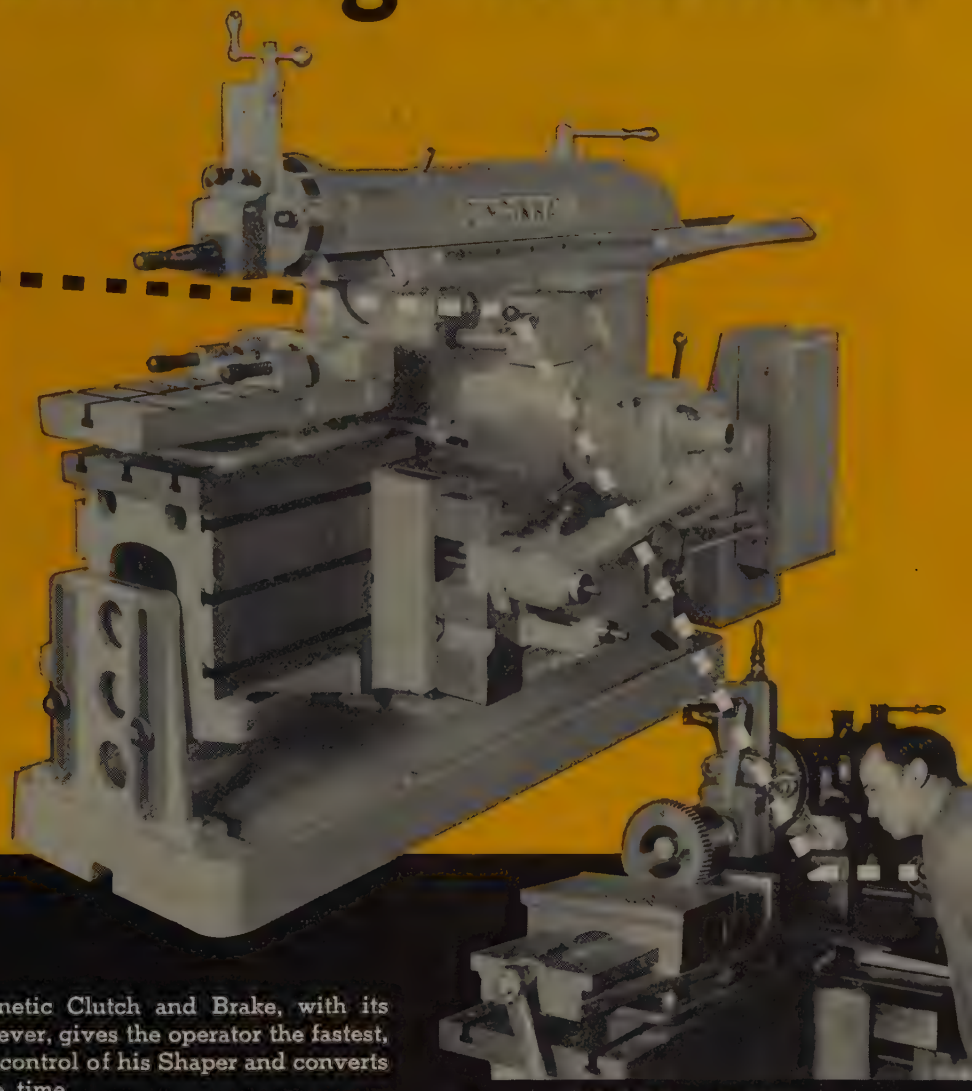
THE GATES RUBBER COMPANY
DENVER, U.S.A.

CS-54

Outstanding Time Saver...

..Outstanding ACCURACY

Single Control Lever



New Cincinnati Magnetic Clutch and Brake, with its e, convenient control lever, gives the operator the fastest, lest and most accurate control of his Shaper and converts time into productive time.

powerful clutch and brake requires no adjustment, and long, maintenance-free life.

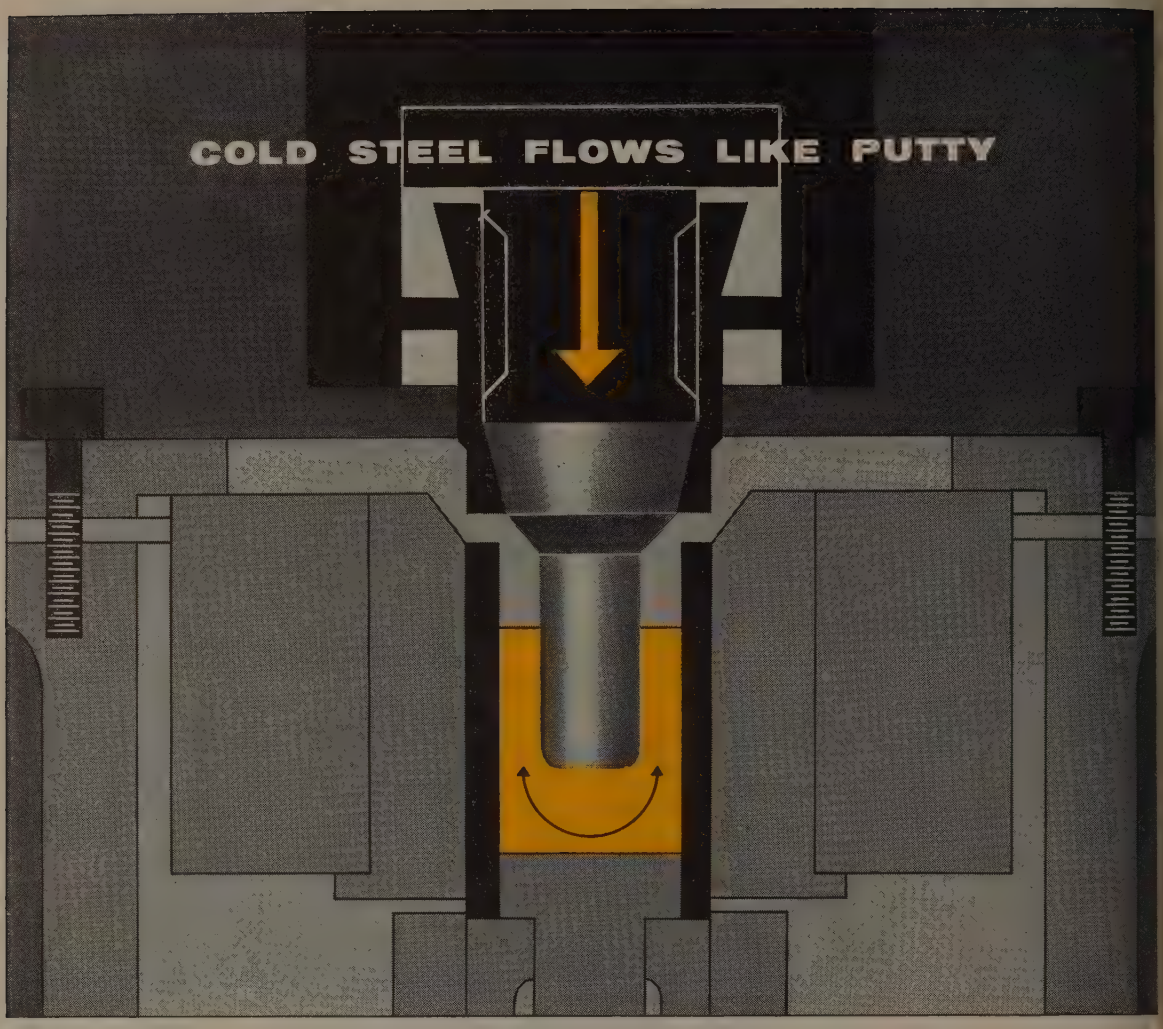
for Cincinnati Shaper Catalog N-5.

30% Time Saving

Shaping time on 7 internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8 minutes, by the Cincinnati Electro-Magnetic Clutch and Brake.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



A vital new metal shaping method is now practical with the Pennsalt Fos Process . . . tubes, shafts, cylinders, gear blanks, piston pins, and other shapes can now be cold formed in presses. This eliminates up to 80% of all machining formerly required . . . produces better parts, faster, for less.

The Pennsalt Fos Process is now being used in automotive, tube, wire drawing, and ordnance plants. The process includes a new Pennsalt lubricant and a proven method of locking the lubricant to the steel.

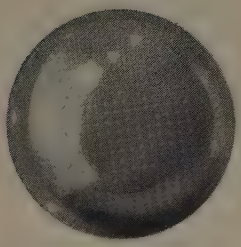
The Fos Process insures the smooth and rapid flow of cold steel through the die, even at extreme pressures.

Practically all of the original metal can be utilized with Pennsalt cold extrusion techniques . . . work cycles can be reduced . . . and over-all production speeded up. Superior physicals can be obtained from carbon steels, along with a better, smoother finish. Multiple draws without interim recoating and annealing, and greater reductions per draw are now practical.

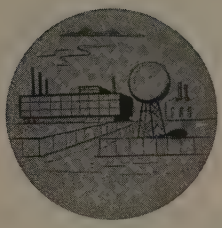
Write today for the complete story, or send us blueprints of product you are interested in. Metal Processing Department, Pennsylvania Salt Manufacturing Company, 50 Widener Building, Philadelphia 7, Pa.

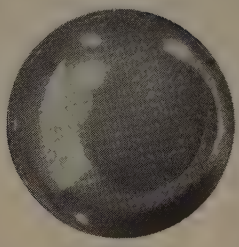
Pennsalt Chemicals

PENNSYLVANIA SALT MANUFACTURING COMPANY

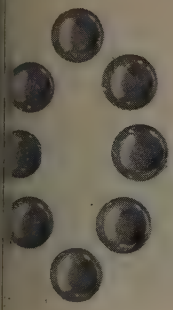


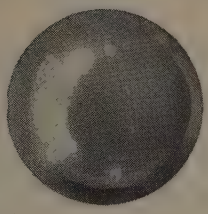
Federalize!

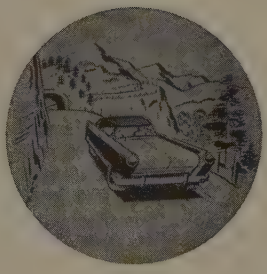




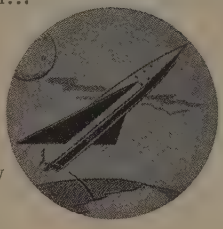
AND YOU'VE MODERNIZED!



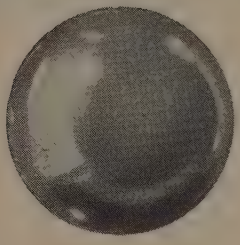




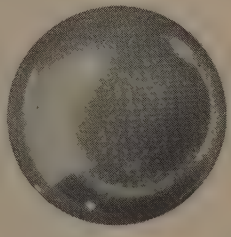
The age of the Big Change is here: the propeller is giving way to the jet...precision is giving way to super-precision... ne instrument quality controls of yesterday re industrial museum pieces today... notion itself has taken a new name: *speed.*



The America that rolled along on Federal ecades ago is a new America, rolling on a new ederal today. The Federal bearing that once moothed the way for one horsepower has been nodernized to do the same job with a 1/10 horsepower.



And change is the order of the day with sources f supply. The purchasing powers across America are taking a new look at the old familiar faces... are re-examining, re-appraising...are learning that esterday's No. 2 sources of supply are ready to become today's No. 1.



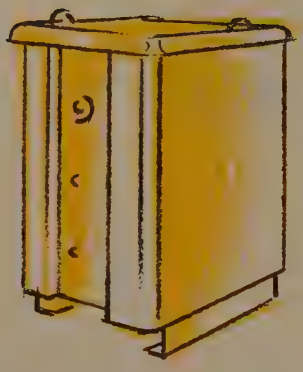
Changing with change...new with the new is Federal. Take a new look at this one of the world's largest ball bearing manufacturers...then specify Federal. *Federalize and—you've modernized.*

Federal Ball Bearings

One of the world's largest ball bearing manufacturers

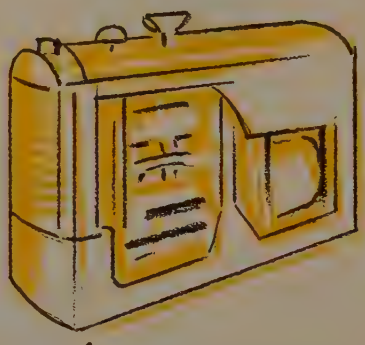
THE FEDERAL BEARINGS CO., INC.
POUGHKEEPSIE, N. Y.
Producers of the *Modern* ball bearing

They're here!
New P&H welding
cost-cutters!



New DC Rectifier Welder

You asked for this one and here it is — 400 amps of low-cost DC welding power at its very best. You enjoy economy, quiet operation, balanced-line loading, and instantaneous remote control.



Two *New* Gas-Drive Arc Welders

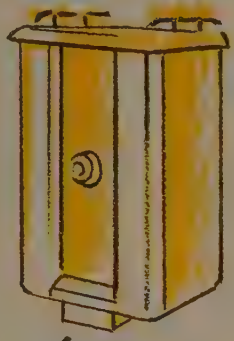
Wait 'til you see the entirely new P&H arrangement of motor, generator, power take-off, and idling device — we think it'll make a hit with you! You get everything you've ever wanted in an engine-driven welder — including features you don't get from any other. Water-cooled and air-cooled models.

New Constant Potenti
DC Power Source

We think you'll agree that th
approach is a sound one. Yo
use this machine to replace
rotating CP equipment, usi
separate grid resistors, as o
vious equipment. And you c
it as a power source for subm
arc welding — and for the in
continuous wire-feed weldin

New High-Frequency AC Welder

Ideal for use with inert gas. Lets you handle "hard-to-weld" metals with ease. Gives you instantaneous heat control you get from no other welder — and does it without moving parts.



New Inexpensive Intermittent Welder

Another P&H first — a low-cost, low-input welder with all the advantages of a heavy-duty machine. Has a top amperage of 300 amps. and an open-circuit voltage of 75. It's the only low-cost welder that lets you weld with low-hydrogen and stainless-steel electrodes.

New AC-DC Welder

Y that's right—you can get either AC or D welding current with just a flip of the sw ch! And the welder operates on *single* ph e. How about that? Here's one new P machine you want to be sure to see!

New High-Speed Electrodes

Three "iron powder" coating types that provide outstanding economies in welding time and costs: (1) A cutting and gouging rod; (2) A single-pass heavy fillet rod; (3) A medium penetrating electrode that operates equally well in all positions.

Some of the most sensational welding developments of all time!

They're brand new. They're P&H. They're designed and built with an eye to improving your production and profit picture.

We think we can honestly say that you've never seen such advanced designs — such outstanding equipment—with so many practical features that make sense to you and your costs department.

If you're interested in improving welding practices in your shop, you'll want to keep abreast of these new developments. Ask your P&H representative or distributor to demonstrate them — so you can see at first hand their many, many advantages.

Or, write for further information.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
4411 W. NATIONAL AVE. • MILWAUKEE 46, WIS.

P&H welding equipment is manufactured and sold in Canada by

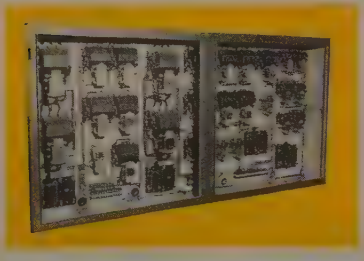
REGENT EQUIPMENT MANUFACTURING COMPANY, LTD.
455 King Street West • Toronto, Ontario, Canada

the P&H line

TRUCK CRANES · RUBBER EXCAVATORS · POWER SHOVELS · PREFABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

Full vision weatherproof cab with sliding windows; equipped for full magnetic control, with cab heater, foot gong, adjustable bucket seat.

Exacting Requirements for Crane Service call for every part to be right



Totally enclosed, fully magnetic control panel, mounted on crane bridge; all parts front-mounted and front-connected.

When EDERER "job-engineers" a crane for you, it is designed and built to your specific materials handling requirements—for your plant—for your industry. Naturally every component part of a "job-engineered" crane must be exactly right for that crane's particular operation. One "plus" in all EDERER-built cranes is this careful attention to parts—which are also oversize throughout. This makes for the most in performance—the least in maintenance—lower cost-per-ton materials handling. You'll probably want to know more specific details . . . why not send for the new EDERER crane catalog—Bulletin CR-610?

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CRANES

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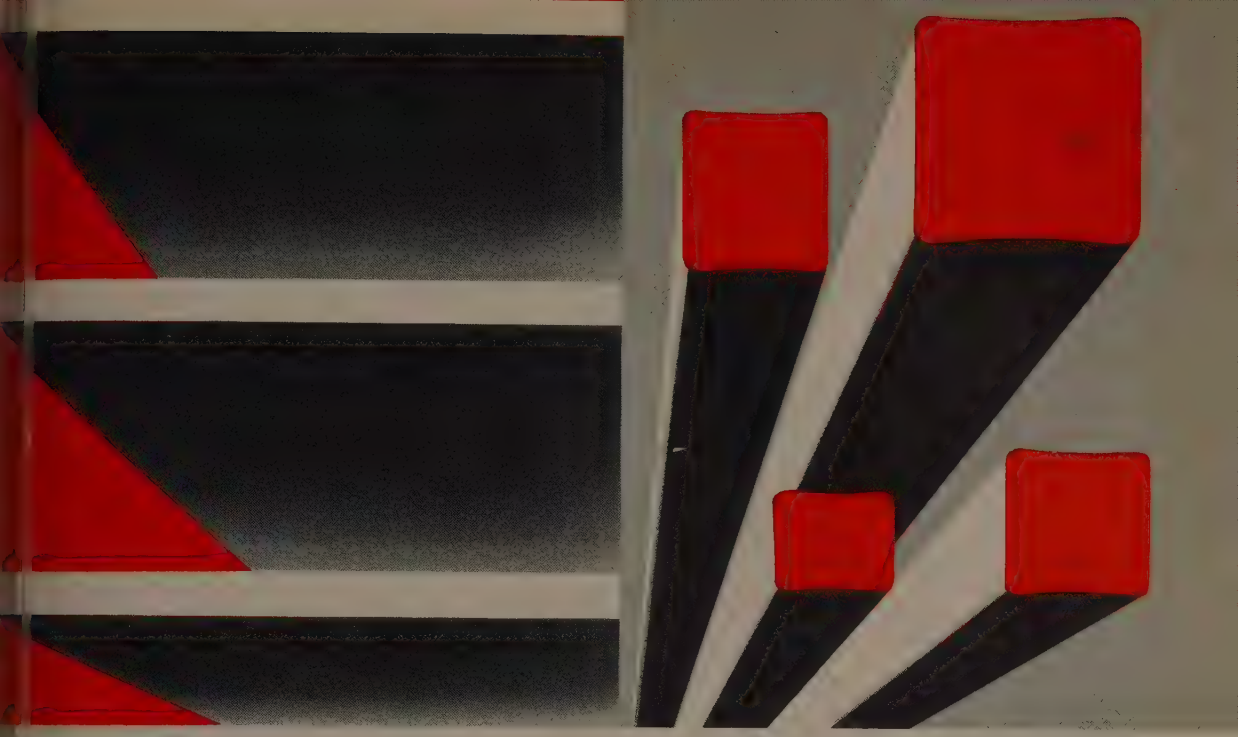
OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY



SLABBING MILLS AND BLOOMING MILLS

Productioneering begins with Mack-Hemp Rolls

If you've been keeping your eye on what's new at Mack-Hemp, you already know about the improvements in Striped Red Wabbler blooming and slabbing mill rolls.

But, just in case you missed hearing users talk about these *production tools*, you'll be interested in their capabilities.

Actually, Mack-Hemp has applied some new heat-treating techniques to reduce susceptibility to fire-cracking. These metallurgical improvements are important because they help increase blooming and slabbing mill production.

There's no time like the present to discuss these efficient Striped Red Wabbler Rolls, and you'll certainly want to know something about their service records. Meanwhile, though, you'll find it's worthwhile to keep an eye on *everything that's new at Mack-Hemp.*

MACKINTOSH HEMPHILL COMPANY PITTSBURGH U.S.A.

MACKINTOSH-HEMPHILL CO.

Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners—electronically controlled contouring lathes—screw feed roll turning lathes—heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills

TITANIUM RINGS?

... sure we make them

In 1950 American Welding completed the first successful production flash butt-welding of the new wonder metal — Titanium Alloy. Since that time hundreds of Titanium components have been produced in our plant.

If you use, or are planning to use, fabricated Titanium components, let our Product Development Division study your problem. Our factory is equipped to perform welding, machining, and fabricating of all types of ferrous and non-ferrous metals.

Call or write us today!

THE AMERICAN WELDING & MANUFACTURING COMPANY • 110 DIETZ ROAD WARREN • OHIO

Metalworking Outlook

Business Upturn?

Signs are accumulating that a business upturn is coming. The inventory liquidation that has been going on since last October is slowing. Look for the end of that trend this month or the next and the start of a moderate build-up before midyear. The two most dynamic supports for the economy currently are construction and capital equipment manufacture. Record January-February new construction contributes to the belief that in 1954 we'll enjoy a $34-billion building year, only 2 per cent under record 1953 levels. New plant and equipment expenditures for the year should reach $26 billion, only 6 per cent under the peak 1953 outlay (see p. 57).

Midwest Optimism

An upturn, too, is coming in employment. Great Lakes Steel Corp. has recalled 1094 of 1903 laid off in late January and early February. International Harvester Co. has rehired 500. In the past two weeks, there have been both hirings and layoffs among auto companies, but the former outbalance the latter by nearly 10,000.

The Increase Declines

Total U. S. employment is now about 59 million. With conflicting government estimates of unemployment, it's hard to know what the precise jobless figure is, but it has been rising since the 3.1-million estimate by the Census bureau for January. A new employment analysis just started by the Labor department indicates that the nonfarm job holders were 300,000 fewer in February than January. However, it sees the rise in joblessness as slowing.

Mr. Beck Steps Up

The Brotherhood of Teamsters' refusal to go along with the AFL-CIO no-raid pact virtually kills the plan and makes less likely than ever the eventual merger of the two big labor groups. The teamster action stems from Teamster President Dave Beck's rivalry with Tom Meany for dominance in the AFL. AFL President Meany backs the pact and says he favors merger. Only about 40 of the smaller unions among AFL's 111 affiliates signed the pact, compared to 34 of the CIO's 35. Mr. Beck's "no" revives rumors that he'll pull out of AFL to form the nucleus of a third big labor group. But odds are against such a move.

American Arsenal

Look for continued high arms aid to our allies in 1954. From October, 1949 through December, 1953, the U.S. gave $7.7 billion worth of guns, ammunition and other military equipment to strengthen free nations against Soviet threats. Nearly half of that total was shipped during 1953. The weapons supplied in nearly four years included 30,792 tanks and combat

vehicles, 5340 aircraft, 601 navy vessels and 2 million small arms and machine guns.

Trouble in Research

Complaints are mounting about an Internal Revenue Service policy that hurts industrial research and development. IRS requires a taxpayer to have a history of consistent practice in charging off research and development costs before he can currently deduct such costs. Thus, a new business with no past practice or an established firm that wants to step up its research is hampered.

Problems in Color

The early color television sets are running into problems of obsolescence and price. Emerson Radio & Phonograph Corp. has decided to lease rather than sell to the public its color units because changes are coming in the sets so fast that those now in production are already "potentially obsolete." Also, the cost of $800 to $1000 for the average receiver now for sale is not encouraging a flood of buyers. The difficulties will be solved of course. National Broadcasting Co., at least, has confidence. It has 26 stations already equipped to transmit color and another 58 have ordered color equipment.

More Leasing

More and more capital equipment firms are readying leasing plans to help market their product. Monarch Machine Tool Co., Sidney, O., is one of the latest to offer a program. Many other firms aren't publicizing or pushing the idea, but they'll do business that way if the customer expresses interest.

Straws in the Wind

Louis E. Wolfson, chairman and president, Merritt-Chapman & Scott Corp., says expansion of newly acquired Newport Steel Corp. is being planned. . . Despite the fact the building industry has rehoused 21 per cent of America since 1945, 41 per cent of the nation still lives in houses or apartments built before 1920 . . . Underbid on a contract for steel towers for the Interior department, U.S. Steel Corp.'s American Bridge Division still got the $2.6-million contract when it was found the low Italian bid was "materially deficient from an engineering design" . . . Within a few years the U.S. will be producing all the uranium it needs for atomic energy purposes, says uranium mine owner Vernon Pick, Grand Junction, Colo. . . . First commercial production of electrolytic chromium has just started at the Marietta, O., alloy plant of Union Carbide & Carbon Corp.'s Electro Metallurgical Co.

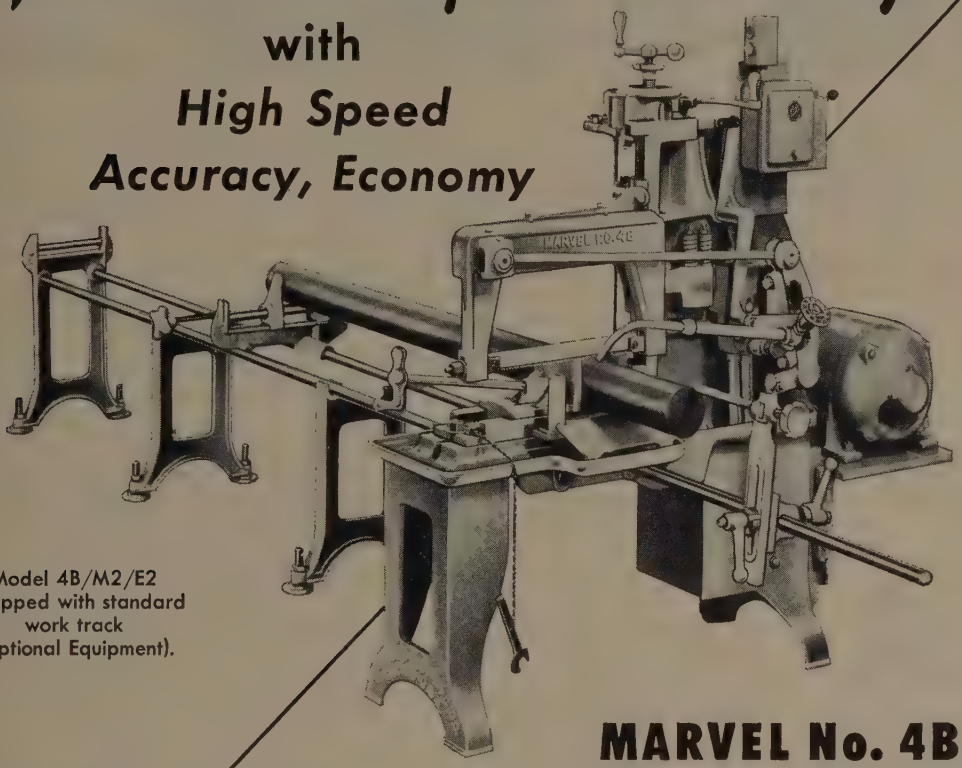
This Week in Metalworking

Will capital expenditures maintain high level volume in 1954? (p. 57) . . . More flexible depreciation law would stimulate the economy in many ways (p. 58) . . . Machine tool builders keep a sharp eye on government plans for leasing defense facilities for civilian production (p. 59) . . . Congressional committee sees gross national product of between $360 billion and $375 billion by 1955 (p. 60) . . . Great Lakes iron ore carriers ready for 80-million-gross-ton season (p. 61) . . . Construction is a prime target for greater use of aluminum in 1954 (p. 62).

For...

General-Purpose Sawing

with
High Speed
Accuracy, Economy



Model 4B/M2/E2
Equipped with standard
work track
(Optional Equipment).

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Reliance ECON-O-GRADE Sheets

Why two grades? For the simple reason that the "right" steel for a particular job is that which fulfills the functional requirements of the job at lowest cost at a particular time.

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. . . It's knowing our "stuff" . . . our "feel for steel."

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The Hard Road Back

A painful lesson that the world is being forced to learn the hard way is that a nation cannot flirt with socialistic schemes without paying a terrific penalty for the experience. Once a country has ventured into the quicksands of crackpot policies, it is difficult to return to the firm footing of sound ideas.

One is reminded of this sobering truth by the attempt of Britain's conservative government to fulfill its pledge to denationalize the steel industry. The Churchill government tackled the ticklish job gingerly. It first offered the attractive properties of the United Steel group at 25 shillings per share. Almost immediately the offering was oversubscribed. However, the later easing of demand for steel and the threats by Labor party spokesmen that they would again nationalize steel if they gained control of the government caused the market price of United shares to fall to 22 shillings, 6 pence. Shares of the Lancashire Steel Corp. group, once offered at 22 shillings, now are quoted at 19 shillings, 6 pence.

In short, attempts to sell to private owners shares of the two most attractive groups of British steelmaking units have failed dismally. This, of course, is deplorable, and yet there are many persons in the United States who are inclined to dismiss this airily as something that is Britain's hard luck and is of little concern to us on this side of the Atlantic.

How wrong they are! They ignore the fact that 20 years of socialism or worse in our country have made it as difficult for the United States to return to sound policies as it is for the United Kingdom to denationalize steel.

The Eisenhower administration assumed office with every intention of balancing the budget, reducing government expenditures, cutting taxes and restoring the value of the dollar. It tried hard to do these sound things but was forced to back away from some of them temporarily because the unsound policies of 20 years were too deeply rooted for a sudden change.

In Britain and here, many decades will pass before the damage resulting from reckless socialistic experiment can be overcome.

E. C. Shaner

EDITOR-IN-CHIEF

VIA CAMPUS RESEARCH: From 1941 to 1952 the money spent on research in the United States mounted from $900 million to $3750 million. During this period research performed by the United States government (p. 69) increased from $200 million to $800 million, or 300 per cent. Research conducted by industry mounted from $660 million to $2530 million, or

283 per cent. The cost of research done by colleges and universities advanced from $40 million in 1941 to $420 million in 1952. This is an increase of 950 per cent, a fabulous figure that can be explained only by the fact that the excellent facilities on many campuses coupled with a better understanding of industrial problems by high-grade university professors have paid off handsomely.

We have a conviction that professors, instructors and students in many colleges and universities could function much more effectively if they knew in more specific terms just what kind of individual talent industry requires in its present battle with technological progress. Here is a wide-open field of opportunity.

* * *

TOWARD AUTOMATION: Any person who has ever had a job in a metalworking establishment has had some knowledge of the importance of gages. The conventional concept of the role of a gage is that it is a tool employed by an inspector to determine whether or not a part conforms to specifications.

The idea that a gage is something to be used by inspectors is being challenged by promoters of automation, some of whom go as far as to say that gages should be taken away from inspectors and placed in the production line. Those who go all out for automation will not be satisfied until the gages in the production line not only throw out pieces failing to meet specifications, but also correct or reset the tools which are responsible for defective work.

In the future we will be hearing much more about air, electric-electronic, optical, mechanical, fixed and penetration gages that are tied in with production lines.

* * *

WITH COMPANY FUNDS: In this week's "Mirrors of Motordom" (p. 71) Floyd Lawrence refers to some factors mentioned by Laurence Pomeroy, technical editor of the British publication *The Motor*, which explain some features of the production, sale and use of automobiles in Europe that may surprise American readers. He says that it is becoming increasingly difficult for a private person in Europe to buy and operate a car on his personal account.

As a result of this limitation, about 90 out of every 100 European cars are purchased with company funds. Last year the 50 major automobile builders in Western Europe turned out 1.4 million cars, yet individuals in that area purchased fewer of its own cars than Chevrolet alone sold in this country last year. Prices of European cars range from $1000 to $10,000, but 90 per cent of the cars sold are in the Volkswagen, Austin, Hillman and Renault class.

* * *

MASS ABILITY TO BUY: Those limitations to the mass purchase of automobiles in Europe afford another illustration of the great difference between the economic structure of the United States and that of most other industrial nations. Here we have an unusually high proportion of wage earning and salaried employees to total population. Also our gainfully employed persons enjoy incomes far higher than those of any other nation. This fortunate condition of many millions of people with high incomes makes for a mass ability to buy that is unequaled elsewhere. Also, this mass ability to buy translates itself in many ways into greater opportunities for millions of persons to enjoy a higher standard of living. It also provides greater freedoms for more individuals than can be found anywhere else in the world.

* * *

A FORMULA FOR PEACE: It is gratifying, of course, that in the United States buying power is distributed so widely that it supports a high degree of mass production which in turn permits the sale of more goods to more people at less cost.

This formula, which has worked so well for us, should work in many other nations where industry has been developed to at least a moderate degree. In fact, if other nations were to adopt our formula and would employ it to distribute buying power more widely, the results would be beneficial to most of the world.

Perhaps it is not too much to say that a better distribution of goods and opportunity throughout the world would be the most effective way of insuring peace for the future.

(Advertisement)

Do You Buy Steel?

Here's a check list for evaluating suppliers

Steel has been in such short supply for so many years that there has been a tendency toward lower standards. With the situation now reversed, it may be well to raise our sights and give the production or fabricating departments a break.

With this in mind the following check list may be worth consideration.

First, on the character and capacity of the supplier:

- ☐ Is the supplier a good dependable company with a wide range of steels actually in stock so I can take full advantage of quantity differentials and save time in ordering and other office details?
- ☐ Am I establishing a business relationship with a company which will be able and willing to supply me with steel at fair prices next month or next year—even if demand should again exceed supply?
- ☐ Can I return the material if it has not been processed and I find that I can't use it?
- ☐ Can I count on the supplier to settle any reasonable difference of opinion to my satisfaction? Is the supplier customer-minded?
- ☐ Does the supplier have, not only the interest, but also the ability to carry my account in times of national stress or a possible financial difficulty?

Second, concerning the material:

- ☐ Is the steel of known, uniform quality so that I know what can be expected of it and can be sure of getting steel of the same uniform quality next month or next year?
- ☐ Is the steel accurate as to size or gauge so that no time is lost in extra processing? Is scrap minimized or eliminated?
- ☐ Is the steel in good condition? Has it been carefully stored, handled and shipped so that it will arrive ready for use?

Third, concerning the service:

- ☐ Can I depend on clean accurate cutting so that the steel will be immediately available for use without further cutting or preparation?
- ☐ Can I be sure of correct weight?
- ☐ Will the steel be delivered when promised so I will get it when I need it, even on very short notice?

No source is perfect, and we certainly do not pose as such. However, we have been serving industry—with good sound steel from stock at fair prices for over one hundred years. And we have been working with our customers in many other ways from helping with finances to solving problems of fabrication and inventory control.

We stand ready to serve you well whenever you call.

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World's largest producer of wagons depends on Inland cold rolled sheets to help keep 'em rolling!

Another job done right with Inland Job-right cold rolled sheets

"Inland cold rolled sheets consistently give us what we need," says Radio Steel's purchasing agent Sol Grottola, (*right*). "Breakage is no problem. We appreciate Inland's uniformity from shipment to shipment—and the way Inland men take a personal interest in seeing that we get the right sheet for our job—at the right price."
RADIO FLYER

To a good many million dads and their sons and daughters, the shiny, sturdy red Radio Flyer is the last word in juvenile transportation. In the past 35 years, Radio Steel & Manufacturing Company depended heavily on Inland cold rolled sheets to maintain leadership as the world's No. 1 maker of wagons.

Specifically, this is what Radio needs in their cold rolled sheets:

Drawability—Bodies are drawn from 3 to 6 inches deep. A few percentage points increase in breakage could be a serious cost problem.

Finishability—That glistening red finish is an important salesmaker. *It's got to "take it," too!*

Strength—Anyone who has been a 7-year old boy needs no further explanation!

Uniformity—At their rate of production any change in uniformity or quality is expensive. Each shipment must be the same.

A sheet that's **job-right** *is a money-saver, a work-saver and a mighty good headache remedy which many manufacturers now get from Inland. Can we help you?*

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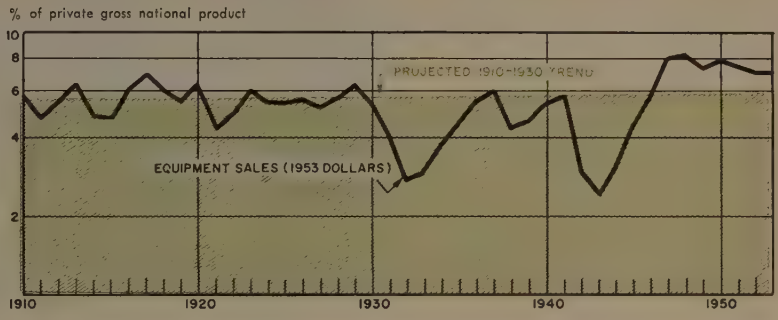
apital Equipment Outlook: Continued Above-Trend Sales in 1954

ff slightly from 1953, capital achinery sales this year are ing well, better than other rable goods. MAPI calcu- tions (right) indicate the od news will hold. Private tlays for production equip- ent, expressed as a percent- e of private gross national oduct, are keeping above e trend projected from actual 910-1930 ratios



ILL THE near-record $26-billion w plant and equipment expendi- res predicted for 1954 really ld up now that business condi- ns are uncertain?

That sum is only 6 per cent der the peak outlay of $27.8 llion in 1953, and the talk is that e economy generally may drop me 10 per cent from 1953 levels. hat's more, some business sages ve wagged their heads particu- rly hard about capital outlays, ying, "New plant and equipment penditures will be the first to ll and will drop the farthest."

The Answer—But they have not opped thus far this year. And STEEL survey shows the $26- llion prediction is not out of line. nd a study of the problem by achinery & Allied Products In- itute reveals that capital equip- ent outlays are not particularly igh in relation to the private ross national product.

Partial results of MAPI's study e shown above. Basically the art shows spending on new uipment is a slightly larger pro- ortion of the private gross na- onal product in 1953 than it was 1910.

Others Below—But other parts f the MAPI study reveal that 953 new plant expenditures are ell below the 1910 proportion nd that combined 1953 new plant nd equipment expenditures are lso below the 1910 proportion.

MAPI went a step further and measured the best "normal" period it could find—1910-1930. The projected trend line of capital spending, based on that period, rises moderately and passes above the combined new plant and equipment spending figure for 1953. Thus, spending in 1953 didn't quite measure up to what it might have been, based on the "normal" business projection.

MAPI concludes: "Certainly there is no suggestion of any excess in total investment since the war, nor is there any indication that the recent rate is not sustainable in the future."

Still High — All that doesn't make $26 billion sound any smaller. The secret is, of course, that in any expanding economy, greater production allows a bigger absolute dollar outlay for capital expenditures even though the proportion of such expenditures to total output remains nearly constant.

Such propitious conditions appear likely to exist in the U.S. for some time to come. As for the first quarter, 1954, most heavy equipment builders—machine tool and machinery builders, furnace makers, conveyor builders—report strong sales.

More Ahead — In the long run, the gross national product will continue to bulk very large. The Joint Congressional Committee on the Economic Report forecasts in that report a gross national product of about $360 billion by 1955 (p. 60).

Then, too, business conditions favor these outlays, says Henry H. Heimann, executive vice president of the National Association of Credit Men. Mr. Heimann cites a round dozen of reasons why this competitive era is the time for business to put its physical house in order. Among those reasons: Need for keeping production costs to a minimum "will require modern plant and the most efficient equipment"; this year "will present a very good time to borrow money at attractive rates"; and a modern, efficient and attractive company "will be able to bid more successfully in the labor market." For those reasons, says Mr. Heimann, surveys made by NACM indicate "capital investment programs will be maintained at a very high level. . . ."

NACM's survey agrees with the results of STEEL's annual survey of metalworking business which forecast a 12 per cent increase in metalworking capacity during 1954 (Jan. 7, p. 121).

Both surveys agree with the MAPI study: Capital expenditures are not out of proportion to the gross national product; high-level spending on new plant and equipment can and should continue at least through 1954.

Depreciation and Economy

Proposed depreciation law changes would boost business, says C. of C. council

MORE FLEXIBLE depreciation allowances will boost the nation's economy.

So says the Council of State Chambers of Commerce in a study which supports the House Ways & Means Committee's recommended depreciation law changes in its revised tax code (see STEEL, Feb. 22, p. 51; Mar. 8, p. 77). The bill is currently before the House and the depreciation law section is expected to win approval without difficulty.

The Proposal—Under the proposal, which was recommended by President Eisenhower, an asset with a 10-year life could be depreciated 42½ per cent in the first quarter of its life and 67 per cent in the first half. A 20-year asset could be depreciated 41 per cent in the first five years and 65 per cent in the first ten years.

Liberalized depreciation would boost the economy in these ways, the chamber of commerce council states:

1. Industry would order more new equipment as a result of being able to recover a major part of new investment in early years. This would stimulate activity in equipment and allied industries.

2. Incentive to buy new tools sooner would result in better products at lower cost available to more people.

3. Early depreciation would shorten the replacement cycle and help reduce the feast-famine cycles of the machinery and equipment industries.

4. National security would be strengthened by the incentive to keep industrial plants modern and efficient with latest technological developments.

5. Small manufacturers and farmers would be helped in their financing of equipment under liberalized depreciation.

6. Flexibility of liberalized depreciation would make possible reporting of true income and eliminate taxation of capital in the form of fictitious profits which occurs under present depreciation rates.

VACUUM MELTING AT CAMBRIDGE
. . . new Syracuse facilities coming

Crucible Broadens Out

It buys half interest in Vacuum Metals Corp., specialty metals producer

CRUCIBLE STEEL CO. of America, Pittsburgh, is taking a new step forward in specialty high-temperature alloy production. Crucible President William H. Colvin announces that his company and National Research Corp., Cambridge, Mass., have joined forces to speed development of vacuum melting of steel and alloys.

Half Interest — Crucible last week acquired a 50-per-cent interest in Vacuum Metals Corp., Cambridge, formerly a wholly owned subsidiary of National Research. Vacuum Metals has been producing vacuum melted steels on a commercial basis for more than two years. Production is now 20 to 25 tons a month. Main customers are aircraft and electronic industries.

Commenting on Crucible's new venture, Mr. Colvin says new vacuum melting facilities including a furnace with 6000 pounds daily capacity will be constructed at Crucible's Syracuse, N. Y., plant. This expansion program is expected to increase Vacuum Metals' capacity by more than 500 per cent in the next year. Vacuum Metals is now producing steels and other alloys at its Cambridge plant.

Consistency — "Higher purity and more consistent properties are achieved through vacuum melting," reports Richard S. Morse, National Research president. Increased availability of these metals will permit longer life and better performance of electronic tubes and increase reliability of precision instruments in automatic control systems, company officials added. Vacuum melted steels also enter production of turbine blades, bearings and other critical parts of jet engines.

Regarding the future of Crucible, Mr. Colvin comments, "Our new partnership with National Research will enable Crucible to produce steels and alloys which will meet more fully stresses, strains and speeds of this atomic age."

Metalworkers Win ODM Grants

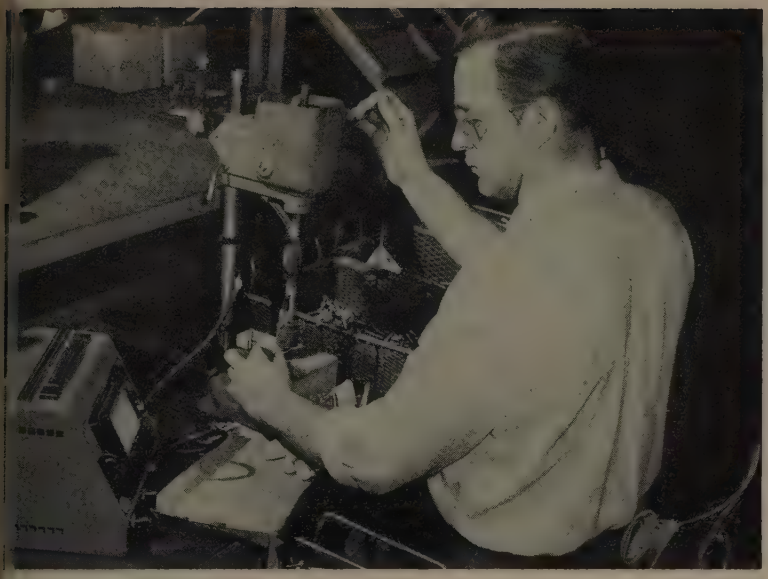
Harvey Machine Co. Inc., Worthington Corp. and Bethlehem Steel Co. were among the firms winning large certificates for rapid tax amortization from Office of Defense Mobilization, Feb. 11 to 24. Certificates were awarded in the period for 66 new or expanded facilities totaling $59 million.

Harvey's certificate amounted to $3.5 million, 85 per cent amortization allowed, for heavy aluminum aircraft extrusions and forgings facilities at its Torrance, Calif., plant. Worthington's certificate of $3.6 million is for pumping machinery expansion at Decatur, Ala., 50 per cent allowed. Bethlehem won two certificates for steel production facilities at Lackawanna, N. Y.: $1.7 million 65 per cent allowed and $600,000 with 50 per cent allowed.

Freight Car Delivery Drops

Deliveries of new domestic freight cars in February were almost 1000 lower than in January and only slightly more than half the number delivered in February 1953. The cars delivered last month totaled 3974 compared with 4941 in January and 7780 a year ago.

The railroads placed orders for 2057 cars in February, making backlog as of Mar. 1 of 25,441 cars. The backlog on Feb. 1 was 27,959. More than three-fourths of the orders placed in February were for refrigerator cars.



New GM Instrument Unscrambles Mixed Metal Parts

AN INSTRUMENT for sorting mixed metal parts with varying alloy content through electric detection similar to the principle of the thermocouple is announced by General Motors Corp.

Like a thermocouple, the GM research comparator's circuit also is a loop of two different metals, but the part being tested forms part of the circuit. The instrument's two probe tips are hot and cold junctions where they touch the metal under test. Since temperatures of the two junctions are constant, the change in metallic composition of the part under test results in a voltage change that can be read on the instrument's meter when suitably amplified.

In its tryout stage the comparator was used to separate mixed stocks of SAE 1112 and SAE 1117 steel differing by only 0.05 carbon content. It was also used to separate two types of automotive valves for experimental engines which differ only slightly in analysis and were inadvertently, mixed. A mixup of 12,000 clutch levers, some of SAE 1010 and others of SAE 1020 were also separated by the comparator and the device has even been used to check for chills in castings.

Several sets of tips are available, and the usual method of choosing a set of tips is simply to try the sets and pick out the one that gives the best separation readings. The instrument is now being tested for measuring thickness of metallic plating or paint films, comparing the surface layer with a similar layer of known thickness. In this application it operates as an ordinary thermocouple, detecting temperature changes at the hot junction.

More Labs Get Fast Write-Off

Fast tax amortization has been made available to a wider range of research and development labs.

Formerly, Office of Defense Mobilization included only labs having defense research contracts which couldn't be met without expansion in the fast write-off category. Now included are labs established in connection with a product or service for which there has been issued a separate expansion goal and labs undertaking development research "clearly demonstrated to be in the interest of the national defense program."

The new goal, says ODM, does not include quality control labs.

A. F. Puts Surplus Tools on Sale

Approximately 300 surplus machine tools are to be sold by the Air Force by competitive bidding on Mar. 23 at the Air Force Departmental Industrial Equipment Reserve Storage Site No. 6 at Marietta, Ga. Included are lathes, grinders, milling machines and miscellaneous production equipment declared obsolete for Air Force requirements.

Builders Hit U.S. Leases

Machine tool makers criticize leasing of U. S. defense equipment for civilian output

CAPITAL EQUIPMENT makers continue to watch closely the Government plans for leasing defense facilities for civilian production. The estimate by the National Machine Tool Builders' Association that the government probably owns one out of five of all the machine tools in the U. S. explains why they're concerned.

The association, which has just come out with its official stand on the matter, points out that if the machines are to be leased for civilian production, they will no longer constitute a reserve. The mere fact that they are still owned by the government will not mean that they are ready and available for an emergency.

Why?—The association reasons that many of the machines now exist as part of production lines or in groupings for particular production steps. Leasing of machines would break up the lines and render them useless until reassembled.

Although the Office of Defense Mobilization last year issued a policy statement that said no further leasing arrangements would be made except under unusual circumstances, tool builders are concerned about the "unusual circumstances." Now pending is at least one application to lease government-owned defense equipment for civilian production.

Competition—Government-owned machines have been leased at 1 per cent of the cost per month, whereas commercial rates are at least double that, and in some cases three times that figure. Government leasing uses taxpayers' money to finance government competition with private industry.

In some cases, leasing will help defray carrying charges on large machines and may be justified. But, the builders feel, such leasing should be kept to a minimum.

What Congressional Economists See Happening to the Gross National Product:*

	FISCAL 1954	FISCAL 1955
If economy goes full tilt	$365 billion	$373 billion
If present trends continue	$363 billion	$360 billion

* Joint Congressional Committee on the Economic Report

MEMBERS of the Senate-House Committee on the Economic Report do not view the current economic situation with quite the same optimism voiced by President Eisenhower at the end of January. They foresee a possible further downtrend in fiscal 1955 (see the table), although a moderate one.

"Our economy today is highly prosperous . . ." said the President. "Thus far at least, the readjustment process has been largely a matter of reducing excessive inventories, especially of consumer durable goods."

Grounds for Pessimism — The committee report states, "Unemployment, however measured, has increased. Industrial production has fallen off, especially in recent months. We have passed from a period of inventory accumulation to a period of inventory liquidation. Farm income . . .has declined with inevitable adverse effects upon those whose prosperity is . . . connected with agricultural conditions.

"Whether one calls these changes an adjustment, a contraction or a recession, it is the facts which are the concern of this committee. While we recognize the significance of the psychological element in maintaining confidence in economic stability, it is equally important that we be alert to understand and improve upon any situation which the facts disclose."

Grounds for Uncertainty — The committee also noted several "elements of uncertainty in the current situation," including: A recognition "that the extent of involuntary unemployment may not be fully reflected in current statistics;" the fact that the current decline is not like the adjustments of 1949 because the pent-up consumer demand still present in 1949 has been largely satisfied; and the necessity for readjusting the nation's economy in line with decreased defense expenditures.

But even so, "the committee as a whole is confident that any serious further recession can be avoided" if there is a substantial increase in consumer demand, business investment and if the President uses what he called "the formidable arsenal of weapons at the disposal of the government."

Grounds for Dissent—Some Democratic members of the committee in a supplement to the committee report state that there seems to be a lack of the "courage and candor on the part of Government officials" called for by the President. They charge that a " 'glossing over' of economic facts prevails" and that the administration is taking a "Pollyanna outlook toward possible developments and their implications for public policy." The Democrats called for a policy of action, including a more effective public works policy and housing program and a tax program that will set off a "chain reaction" of consumer buying.

The Republicans joined the Democrats in a blast at the administration's farm policy. The committee report stated, "We do not feel that the program goes any substantial way toward solving even the immediate agricultural problem . . . On the contrary it seems more likely that the proposed shift to 'modernized parity' at this particular time would be an unnecessary disrupting factor." The committee went along with the President's proposals for raising the national debt limit, increasing imports, at least "in certain lines," and broadening social security legislation.

House Passes Insurance Bill

Carrying out one of President Eisenhower's proposals to Congress, the House passed H.R. 5173 to put the nation's unemployment compensation insurance program on a secure basis financially. Instead of going into the Treasury's general fund, the federal government's share of the unemployment insurance tax collections is to be placed in a special fund, to go to $200 million, out of which loans could be made to states whose unemployment insurance funds become depleted. In addition, the excess of federal unemployment insurance tax receipts over the appropriation by Congress to pay for the system's administrative expenses would be credited to the states on a prorated basis.

The bill now is before the Senate Finance Committee.

Aircraft Employment Rides High

Employment, now about 300,000, in the West Coast aircraft industry continues high and is expected to increase during 1954.

Douglas Aircraft Co., El Segundo Division, employs 23,340 persons, surpassing its World War II figures, and plans to add 5000 more to the work force this year.

Northrop Aircraft Inc., Hawthorne, Calif., expects to add 1000 workers to its current 22,000, and Lockheed Aircraft Corp., Burbank, Calif., is maintaining a work force of 30,000.

Inland Steel

Lake Superior Ore Shipments Will Slip

(Gross Tons)

1954	80,000,000 tons*
1953	95,844,449 tons
1952	74,910,798 tons
1951	89,092,012 tons
1950	78,205,592 tons

* Estimated by STEEL
Source: Lake Superior Iron Ore Association

Lake Carriers Ready for Easy Season

The Great Lakes ore-carrying fleet will bring down only about 80 million tons of ore this season. That means a late start and early lay-up. Imports will increase

SURPRISING NO ONE, the Great Lakes iron ore carrying fleet will be off to a late start in 1954.

Pittsburgh Steamship Division of U.S. Steel Corp. says its 59-boat fleet will be readied starting Mar. 23 for sailing sometime around Apr. 20. Four boats of the Pittsburgh fleet are scheduled to start earlier to begin hauling limestone from the Calcite, Mich., area.

Late Date — Even those dates are ahead of most of the Great Lakes fleets. Bulk of the vessels won't be in service until May 1, latest opening since 1950.

Reason behind the late start is the moderate goal for iron ore to be hauled down from upper lake ports in 1954—approximately 80 million gross tons compared with 95,844,449 tons brought down in 1953 (see the chart).

Record Season—Added to the 95.8 million tons of iron ore transported by boat last year, another 3,070,000 tons were brought down from Lake Superior mines by all-rail movement. The result was a record-smashing 98.9 million tons of iron ore hauled from the area in the 1953 season. Another 22.1 million tons came from other U.S. areas.

This total peak U.S. ore production of 121 million tons last year, combined with diminished operating rates at U.S. blast furnaces and steel plants, has left a record spring stockpile of unused ore—41,974,242 tons as of Feb. 1, 1954. That's nearly a six-month supply, based on the December and January rates of consumption.

It's Different—So it's no wonder that the lake carriers feel the pressure is off this season. It is, in fact, the first time in the last 15 years that the carriers haven't been operating on an emergency or near-emergency basis.

The Lake Superior region remains the largest U.S. supplier of iron ore, producing 80.6 per cent of the total in 1953; southeastern states' output slipped to 6.4 per cent from 7.4 per cent in 1952; northeastern states' output increased to 5.0 per cent from 4.5 per cent in 1952; and western states' output decreased to 7.5 per cent from 8.0 per cent in 1952.

Foreign imports of iron ore rose to about 10.5 million tons in 1953. Canada supplied just under 2 million tons and Chile, Sweden and Venezuela supplied just over 2 million tons each. Liberia and Peru approached the million-ton level while Brazil, Cuba and Mexico supplied over 200,000 tons each. Other supplier countries included Algeria, Costa Rica, Denmark, Dominican Republic, Iran, Spain, Tunisia and the United Kingdom, says the Bureau of Mines.

Increasing Imports — By year-end 1954, foreign sources will be capable of supplying more than 20 million tons of iron ore annually and ore imports are scheduled to increase sharply in 1954 and reach up toward the 20-million level in 1955 despite a slackening in demand. Part of the answer is the effort to conserve the strategic direct-shipping, open-pit ores of the Mesabi range.

Even the moderate hauling goal for 1954 and increases in imports of iron ore do not tell the whole story of why the Great Lakes fleet expects an easy season. The fleet itself is enlarged and modernized from its immediate post-war state. Best proof of that condition is the fact that the Great Lakes fleet hauled the record-busting tonnage of 96 million tons last year. And that without any December trips and very little in the last two weeks of November. Last year was the first time since 1944 that no ore was loaded in December. In other words, the haulage last year could have been greater if demand had forced keeping the season open.

All-Time High — The present ore-vessel capacity is about 2.9 million tons per trip with 276 bot-

toms scheduled for service in 1954. That compares with 3,175,600 tons and 280 bottoms at the end of the 1953 season with 3,070,030 tons and 279 bottoms at the end of the 1952 season. It must be remembered that the tons-per-trip total of the fleet doesn't reflect the faster, more modern ships now in service which make possible more trips per season. Thus the season capacity is probably at an all-time high.

Apparently all of the lake carriers will get the spring fit-out, so that they're ready for service. And most of them will be used this year, the fleet captains compensating for less haulage by a shorter season. You can look for the 1954 season to close by mid-November unless there's a big change in business conditions.

Renegotiation Liberalized

Tool and capital equipment manufacturers gained a victory last week. The Senate Finance Committee, in voting to extend the renegotiation act, amended House bill, HR 6287, so that equipment purchased with government funds and adaptable to commercial use will be eligible for automatic partial exemption.

Under present law, sales of equipment to private industry for defense production are subject to only partial renegotiation, since they can be used later for civilian production; but sales of equipment to the government are subject to renegotiation for the entire purchase price, even though they, too, can be used later for civilian production.

Under the new amendment, partial exemption will still be determined by use of the fraction in which five (estimated length of the mobilization period) is the numerator and the denominator is the number of years of expected life of the tool. Thus, the fraction 5/20 would mean the renegotiable portion of the cost of the tool would be 25 per cent.

In addition, further exemptions covering use of such equipment during the initial 5-year period for nondefense production will be allowed.

Final approval of the bill as amended is expected.

Light weight panels speed building erection and simplify . . .

Construction: Aluminum's Target for '54

New products and higher production—these form the base by which the aluminum industry hopes to boost construction sales to 25 per cent of total volume

WATCH FOR CONSTRUCTION to become the leading consumer of aluminum in peacetime. Salesmen for the light metal say construction accounts for 20 per cent of aluminum sales now with prospect of a rise to 25 per cent this year. Industrial construction should take a larger slice of aluminum output in 1954, producers add. Only aircraft manufacturers rank as better customers.

Bureau of Mines statistics show primary aluminum production increased from 836,881 tons in 1951 to 937,331 tons in 1952, surpassing 1943's peak of 920,179 tons.

More This Year—I. W. Wilson, president of Aluminum Co. of America, Pittsburgh, reports the American aluminum industry followed its record-breaking precedent by producing about 1,250,000 tons of primary metal in 1953.

While production grows, use of aluminum in construction also mounts. "We expect all construction to account for nearly 25 per cent of aluminum sales soon," says Herbert Johnson, assistant manager, architectural division, Alcoa. "Aluminum's newest target is industrial construction. We have been held back in this field by a shortage of the metal. Now, with more aluminum available we expect to boost our sales."

Walls and Roofing—"Metalworking industries are using more aluminum paneling and roofing in new buildings," reports an Illinois steel maker. "First installations near galvanizing and pickling tanks showed the metal's anticorrosive features. Now we use it in exterior applications and in erection of high walls where we want a light load on foundations."

While paneling and roofing make up the bulk of aluminum's contribution to industrial construction other products are gaining in use. "Since initial tests, the steel industry has found flooring, railing, gutters, downspouts and building hardware valuable in various applications," comment sales officials of Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Sales Boosters—Other aluminum attributes which have helped push sales higher, according to Nichols Wire & Aluminum Co. and Reynolds Metals Co. officials: Corro

s resistance, reflective insulation
ue, high thermal and electrical
ductivity, and formability.
With sights set on higher indus-
l construction sales, aluminum
ducers are planning larger pan-
sections for quicker building
ction. Porcelain enamel applied
aluminum for permanent and
ght color is another develop-
nt. More aluminum production
s these developments may open
industrial markets aluminum
ducers are hoping for this year.

C Offers Loan Pool to Public

Reconstruction Finance Corp.
s issued a formal invitation to
public to apply for 3½-per-
at certificates of interest in the
aller business loans now held
RFC. Under the Loan Pool
an, banks and investors may
bscribe, in multiples of $5000,
an unlimited amount of the
7-million pool. RFC is scheduled
go out of business June 30, and
e plan is part of the liquidation
ocedure.

Subscribers may not buy any
rticular loan but will take an
terest in the whole group of
ans. About two-thirds of the
00 loans are for less than
5,000 and about 90 per cent of
em are for less than $100,000.

Applications must be filed by
ar. 25, and certificates of interest
ll be allotted not later than April
Detailed information regarding
e plan is available at all Federal
serve Banks and RFC offices.

ectronics Grows Up

Electronics is America's fastest
owing major industry.

So said D. G. Mitchell, chairman,
lvania Electric Products Inc., at
e February dedication of a com-
any defense-electronics laboratory
Mountain View, Calif.

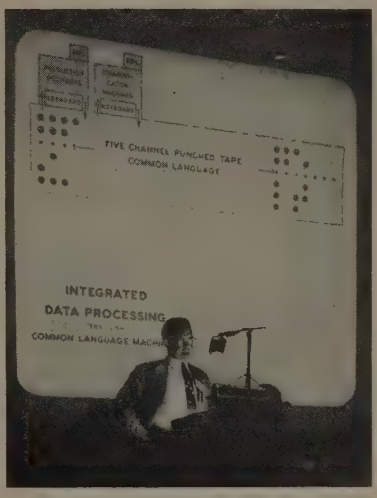
Present output of the electronic
dustry is at an $8-billion annual
te and by 1960 should be more
an $13 billion yearly, estimates
r. Mitchell. "I cannot envision
y other major industry that will
row that fast."

While government purchases of
ectronic material were about $2.8
illion in 1953, "we foresee govern-
ent purchases in the vicinity of
3.8 billion in 1960."

Electronics: Challenge to Paper Work

Electronic equipment promises to take the drudgery out of repetitive office operations. U. S. Steel perfects a new system and plans companywide installations

THE PAPER-SHUFFLING, pencil-pushing drudgery of repetitive office operations is shaping into a large sales target for electronic equipmentmakers—and an area of spectacular savings for business and industry.



OFFICE MECHANIZATION
. . . demonstrating advantages to AMA

By adapting office methods and procedures to take advantage of electronic mechanization, management can weed out an extraordinary amount of wasteful clerical routine, equipment manufacturers assert. At the same time, all levels of management can have complete information on operations quickly.

Language Factor — You can't simply plug in a machine and empty your office of clerks though. Thorough preparation is a vital prerequisite to office mechanization. A major stumbling block to integration of all office machinery into one system has been a lack of a common language. Data from a calculator means nothing to an automatic typewriter.

After working for more than seven years, U. S. Steel Corp. has perfected a "universal tongue" for linking the native tongues of office machines to each other. Suitable for use where data processing involves repetitive operations, the system can be used by companies with as few as 350 employees. An installation has been operating at U. S. Steel headquarters since last spring and will eventually be set up throughout the entire corporation.

Demonstration — Teaming with nine equipment manufacturers, U. S. Steel demonstrated its system at a special conference in New York sponsored by American Management Association. A panel from the company's Methods Planning Division, headed by H. F. van Gorder, showed its system for handling recurring paper work.

Basic concept of the system is to make all data self-perpetuating and thus eliminate necessity for copying. U. S. Steel decided to record data automatically or manually at time and place of origin on devices which preserve the data in mechanical form. This is done on a five-channel tape punched in a uniform communications code; it's the common language link between original recording and all subsequent data handling. Thus can be integrated the processing of data on a sale from the writing of an order all the way through its execution, receipt of payment and preparation of statistical records.

Performance — The operation is adaptable to clerical aspects of sales, purchasing, production or other functions. Users also have an opportunity to find in minutes, instead of hours, the answer to such questions as most economical lot size for production, optimum inventory to carry, most efficient use of manpower and machines.

Necessity Creates a Market

A big market is looming for manufacturers of waste treatment facilities. According to a study by the U. S. Public Health Service, new or improved facilities at 893 locations are needed in the Missouri river basin to meet requirements of the Federal Water Pollution Act. Estimated cost to industries and municipalities involved: $186 million.

Automation's Cause Suffers as Congress Economizes on Research

THE CAUSE OF AUTOMATION was not helped when the economy-minded House of Representatives, in passing the appropriation for the National Bureau of Standards, refused to approve more funds for the program known as "research and testing."

For fiscal 1953 Congress voted $8 million for this program. For fiscal 1954 the figure was reduced 25 per cent to $6 million. Now, in the face of greater need, the appropriation has been continued at $6 million for fiscal 1955.

Interested parties, including the secretary of Commerce, now are appealing to the Senate Appropriations Committee for corrective action. On what the Senate does hangs the hope that much more than $6 million will be provided for this essential program. The matter is of fundamental concern to the nation as a whole, since industry plans to spend billions of dollars on new capital equipment for automation as fast as it can perfect its plans. The automobile industry alone plans to spend as much for new machinery in the next five years as it has in the past 25—depending on how rapidly it can effect automation. That means business, employment, and more money for taxes.

New Needs in Automation . . .

The present rage for automation aims at preventing undue increase in manufacturing costs in the face of today's high unit wages. All mass-production industries—bread, steel, coal, radio and television, automobiles, machine tools, clothing and so on—are striving toward this goal by increasing labor's productivity. More jobs are to be done mechanically and automatically, without the intercession of human beings. That, in essence, is what the term "automation" implies.

But to incorporate automation in mass-production operations you need precise measurements and standards. You need better, more accurate, electrical instruments

for measuring resistance, current and voltage. You need more samples of minerals and metals against which to compare commercial products. You need more precise instrumentation — requiring highly developed standards for gages. You need perfect control of dimensions and tolerance allowances. You need standards of weight and temperature.

A good illustration is found in the new system of building electronic instruments of small ceramic wafers; the need is for three-dimensional size control, and also weight and temperature controls. You need more precise optical standards—as, for example, in better optical pyrometers for measuring temperature by color. And you need 100-per-cent testing and measuring stations throughout your production line to catch trouble immediately as it develops at any point

The Bureau Can Help . . .

That's where the bureau comes in as the nation's top authority in the field of weights and measures. A large part of this work is done for industry on a fee basis as companies submit problems involving measurement, calibration, working standards vital of solution before going ahead with plans for automation. The work is self-supporting.

However, there is a gimmick. The fees paid in by industry go to the Treasury, and the Bureau of Standards has to pay its expenses out of new appropriations. So when Congress is niggardly, the program suffers. There was a substantial reduction in the present fiscal year in the number of trained workers in the bureau assigned to the "research and testing" program. Unless the appropriation for fiscal 1955 is increased in the Senate it will be impossible to increase this personnel in the period ahead.

The bureau, because of this situation, is a full year behind in this work. Work on requests received from industry in March, 1953, is only getting started. There is no hope of speeding up this vital work unless the present appropriation is increased—and the demand for capital goods will lag accordingly.

A Matter of Money . . .

Secretary Sinclair Weeks is expected to push the matter before the Senate Appropriations Committee, and he has wide support among leading scientists and technicians. One of the principal recommendations of the Kelly committee, following its study of the National Bureau of Standards last year, was for a recognition of the fact that the bureau, in shifting from its war and defense assignments to its normal functions in the field of standardization, needs a far larger appropriation than ever before to meet present-day needs. This recommendation was agreed upon unanimously.

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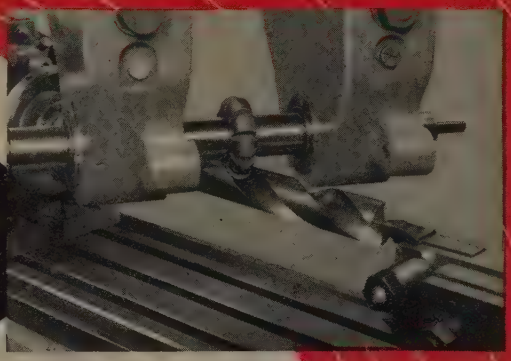

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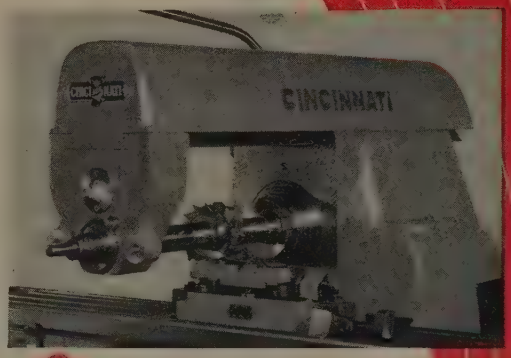
CINCINNATI 9, OHIO



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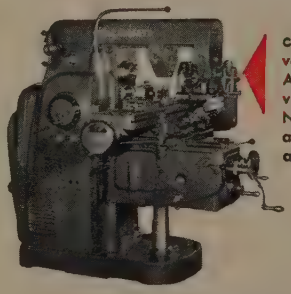

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Denationalization Bogs Down

Shares of two major steel companies offered for denationalization are selling at discount. Prospects for coal industry denationalization are even poorer

THE BRITISH conservatives' attempts to denationalize the British steel industry have met some sobering reversals.

So far, two attempts have been made to sell back to private interests the two big units in the industry. Both have been comparative flops.

Few Takers—The famous United Steel group was offered to the public with shares priced at 25 shillings (1 shilling = $0.14). At first it was over-subscribed. Since the time of that first offering the market price of the shares has fallen to 22 shillings, 6 pence or a discount of 2 shillings, 6 pence.

The second group to be offered was the Lancashire Steel Corp. group. Shares were offered at 22 shilling and found few takers from the first. Lancashire Steel stock now stands at 2 shillings, 6 pence discount as well.

Still at Discount—The two steel groups offered are among the most efficient in England and are considered to have a profit-earning capacity second to none there. The price at which the groups were offered back to private investors was less than that at which they were nationalized. But they still sell at discount.

To denationalize the coal industry which is operating at heavy losses would be even more difficult than the case of the steel industry. Undoubtedly some of the more profitable mines could be easily sold. But others stand little chance of being resold and might well have to be shut down.

Holding Back—The fact is that the nationalization of the steel industry was considered immoral by many Britains—there being no private willing seller and willing buyer. And the threat that the Laborites would repeat the nationalization process should they return soon to power holds many British investors back from steel company stocks. Decline in world demand for steel has worked against the denationalization process, too.

More Steel for Reds

The territory of Saarland, German-speaking and attached economically to France, reports Soviet Russia was its biggest foreign buyer of iron and steel in December, 1953, last month for which figures are available.

Saarland exported $800,000 worth of mill products to Russia and only $634,294 worth of such products to North and South America combined. Trade with Russia resumed in October, 1953, under a French-Soviet agreement.

Labor Looks at Tariffs

Organized labor's divergent views on tariff barriers are brought together in a two-year study, "Labor and the Tariff," recently completed for Timken Roller Bearing Co., Canton, O., at the instance of its president, William E. Umstattd.

The 2800-page study traces the history of tariff views on the part of U. S. unions from the first convention of the American Federation of Labor in 1882. One thing stands out: While agreeing with low tariffs in principle, there is little unanimity on the part of organized labor as to how far they can be carried in practice.

New Belgian Customers

Two orders recently received in Belgium are especially noteworthy:

One is with Spain for $3.3 million worth of steel products and $10.7 million worth of fabricated products and equipment.

The other is with Russia for $60 million in fabricated products. These are to be delivered between 1955 and 1957 and include 10 ships, 4 floating cranes, 10 smaller cranes, 18 ship boilers, 25 boilers, and electrical transformers and generators aggregating 180,000-kva capacity.

Authenticated

Ride on a Rotor

A new 50-passenger bus built by Oerlikon Engineering Co., Zurich, Switzerland, is powered by a 3300-pound gyroscope rotor. The rotor activates an electric generator that propels the driving motors of the bus. Recharging is required every 4 miles

Machine Tools for Britain

Standard Motor Co. Ltd., Coventry, England, plans to spend $9.1 million on machine tools this year to meet growing competition in world automobile and tractor markets. The money will be spent to increase output of diesel engines and Standard 8-cylinder car engines and to bring a new model tractor into production. British automobile makers aim to produce 1 million vehicles this year.

GM Leaves India

General Motors Corp. is closing India's largest automotive plant on Mar. 31. Ford Motor Co. of Canada, which operates the second largest plant in India, is expected to announce a similar closure shortly.

Reason behind the moves: Import duties on knocked-down cars for assembly in India make prices on finished cars prohibitive. India wants more of the manufacture done in that country.

NEA

INDUSTRY GOES TO COLLEGE . . .

CUTTING oil on the ivy is attracting industry back to college for the answers to its problems.

Research projects like recovery of manganese from open-hearth slag at Illinois Tech, fatigue quality studies of steel at Case Tech, effect of welding techniques on brittle fracture of butt welds at Columbia, experimentation in forging steels at Carnegie Tech and a miniature steel mill at Purdue are examples.

Hope from Industry — Since 1941 university research has grown from $40 million to almost $500 million annually (see the table). And while industry research has sagged from 73 to 68 per cent of the nation's growing annual total, the university cut has risen from 5 to 11 per cent. Government contracts have been the prepondderant force in the college research increase, but most universities expect industry projects to take up the slack as defense jobs begin to fade and are launching programs to be sure that they do.

Behind educators' increased attention to industrial research lie no declining football gate receipts, though money is a factor. Improved and expanded facilities as well as stipends to struggling students and extra income for professors are not to be discounted. Several larger schools handle nonprofit research budgets in excess of $5 million annually which afford plenty of deductible collegiate comforts.

Healthy Intimacy — But most important is the fact that colleges are finding their growing intimacy with industry a healthy thing academically. Professors working on live industrial problems don't lose contact with outside thinking, they find, and tend to think less in dusty formulas. That increases their teaching effectiveness and aids them in better preparing their students for jobs after graduation. By the same token, students who assist in research are translating their textbooks into action and find greater meaning in their study.

Merely as an aid to better training of its future researchers, industry would find much to commend the growth of its research in universities. But there are other sound reasons why industry is giving a growing share of its problems to the colleges. Foremost is the fundamental industrial criterion of lower cost and higher efficiency.

In Favor—Often through pooling research for the industry, companies avoid needless duplication of effort and all share the saving. Often, too, companies have problems that are one-shot propositions. Under such circumstances it is inadvisable for even larger corporations to buy special equipment or hire skilled personnel to do the job, particularly when at many universities specialized and expensive devices like electron microscopes and electronic computers are available together with top experts in such fields as physics, mathematics and mechanical engineering to be called upon as needed.

That, figure the universities, adds up to an efficient research plant.

Case in Point—An example of a research plant in action involves a manufacturer of hydraulic pumps. Having made hydraulic units for other applications, the firm decided to enter the power-steering pump field. A unit was designed, but in tests unacceptable steering vibrations appeared at speeds of 50 miles an hour. Although the firm was well qualified in the design and manufacture of pumps it realized that factors of steering geometry and sympathetic vibration were present which it was unqualified to handle and called in a university.

In the school laboratories the physicists and mechanical engineers got their heads together on the forces creating the vibrations. When they had been evaluated the mathematicians were called in to express the situation as a formula. Finally the formula was run through an electronic computer giving the manufacturer a table of varying values as thick as a telephone book.

Pro and Con—Not only was the original problem solved, but the manufacturer had a fundamental formula and table which could be applied to any future hydraulic power-steering pumps he might wish to design. However, that table symbolizes both the advantages and limitations of university research for industry. Although schools work cheaply and effectively on industry problems, there are areas of research that they will not tackle.

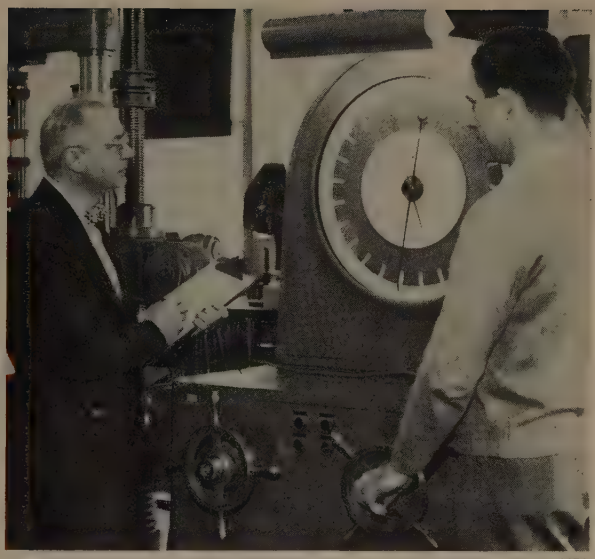
Most colleges are interested in fundamental research as differentiated from application research. In the case of the hydraulic pump maker, something new was learned concerning a configuration of forces. But many who go to the universities with product design problems come away with a polite thumbs-down reply. Mere application of laws and principles already known is difficult to justify as adding to knowledge.

Not Competitive—That's why the universities don't regard themselves as competitive with consulting firms. On the other hand one school developed an improved headlight dimmer, a quieter telephone booth and an effective rodent repellent for baler twine. Problems like this slip into a catch-all category of "application of old laws in new ways to realize

r answers in research

WHO FOOTS THE RESEARCH BILL?
(in millions of dollars)

Year	Government	Industry	Colleges	Total
1952	800	2530	420	3750
1951	700	2300	360	3360
1950	570	1980	320	2870
1949	550	1790	270	2610
1948	570	1820	220	2610
1947	520	1570	170	2260
1946	470	1190	120	1780
1945	430	990	100	1520
1944	390	910	80	1380
1943	300	850	60	1210
1942	240	780	50	1070
1941	$200	$660	$40	$ 900



NEA

herto impractical goals." It's te possible that your problem ght fit here also.

Universities will be glad to en to the problem you have as company or as an individual. u may get the bit of informaon to untangle your puzzle in t a brief conversation with a ofessor who has already reched the area. Typical industal stumpers on machinability, lants and metallurgical properes can often be answered quickat little or no cost.

How To Start—If it turns out at your problem is bigger and alifies as basic research, you'll eet with a research head and tablish a definition of the probm. An initial approach is agreed on and a man-hour schedule is t up based on how fast you wish e work to proceed. Finally, on e basis of the man-hours and uipment required a contract is awn up setting forth the maxum budget over a definite pe-od of time. Extensions of time cost are made only with your proval.

Patent arrangements vary, but ost are comparable to that at e University of Michigan. Payent of a 10-per-cent patent harge on the budget cost perits the sponsor to make exclue patent application whenever ything of a patentable nature evelops in connection with his roject. Should he decide not to patent, the sponsor receives an irrevocable license to make use of any patented item or process resulting from the research without payment of any additional fee.

No Guarantee — It's important to note that the university does not guarantee any specific result but only agrees to work along the approach established. More often than not different approaches will be tried in the course of a given research project with the consent of the sponsor until the eventual solution is reached.

That's a significant difference between development and research —development works toward a preconceived product or objective; research follows any pathway that seems to be leading toward the light.

Small Companies Needed—Perhaps for that reason it's the larger companies that are making greatest use of university facilities. But the colleges point out that companies with less than 500 employees account for 35 per cent of manufacturing employment yet do less than 10 per cent of the research. Over the long pull they feel that their greatest service may be to the small firm which cannot afford a large research staff of its own.

But in the meantime the larger companies are literally moving in on campus. Inland Steel Co.'s "baby steel mill" and the Association of American Railroads Laboratories are on the Purdue campus while Standard Oil of Ohio maintains a laboratory at Western Reserve University. An electronic computer supported by private interests in Detroit was recently installed at Wayne University and a contemplated automotive teaching laboratory at the University of Michigan has hearty auto company support.

Other Aids — Universities are also taking steps to increase their service to industry through seminars and wider publication of research developments. Indicative of the trend is a program at Carnegie Tech which involves reports to co-operating companies on research results and conferences with companies on research and related industrial problems. Dr. R. F. Mehl, director of the Department of Metallurgical Engineering at Carnegie Tech, explains that the school is training its students for the particular industrial situations they will encounter at Pittsburgh.

The implications of this growing movement in education institutions are significant to industry. Important is the fact that university facilities are providing answers to the immediate problems of industry. But the groundwork is being laid today for smoother and more rapid joint advancement of theoretical and applied research in the years ahead.

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NATIONAL STEEL CORPORATION

Economics Perpetuates Small, Low-Powered European Cars

DETROIT

WHEN YOU COMPARE an average European car with a Chevrolet as in the table on the right, at first glance it might appear that the Europeans are a race of midgets who drive only on downhill roads. To understand the perpetuation of these designs it is necessary to visualize a country with roughly the population of the United States but supported by only one-third the work force. That cryptically summarizes Western Europe today, and it's an important factor in the size of those funny little furrin cars.

Other Factors—There are other contributing economic factors, of course, like the burden of arms. The tax money which paid the postwar development costs of only two British jet engines would have bought one-eighth of all the new cars put on the British market during the period. And a 100-hour test of a typical jet engine consumes enough fuel to keep 3 per cent of all British cars running for a month.

Similar erosions of private buying power can be seen in most other European countries, says Laurence Pomeroy, technical editor of that delightful British publication, *The Motor*. Thus it is becoming increasingly difficult for a private person in Europe to buy and operate a car on his personal account, with the result that 90 European cars out of 100 are purchased with company funds. And although 1.4 million cars were turned out last year by Western Europe's 50 major automakers, the natives of that region purchased fewer of their own products than Chevrolet alone sold in this country last year.

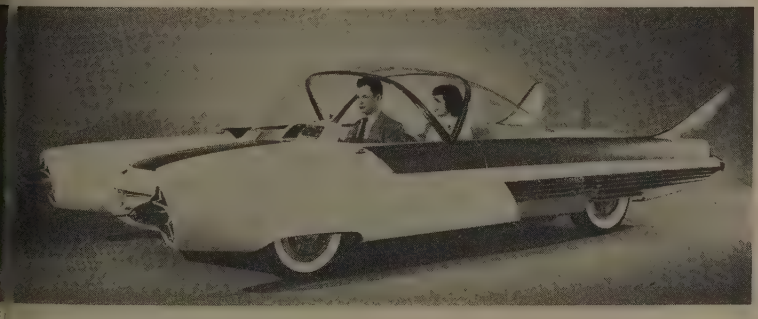
Variety—Although the output is limited, the European buyer has a wide type of vehicles to choose from. Weights range from 1100 to 5900 pounds, engine output from 9 to 210 horsepower, maximum road speed from 45 to 145 miles per hour and fuel consumption from 10 up to 40 miles per gallon. Prices vary from $1000 well up beyond $10,000, but about 90 per cent of the cars sold fall into the Volkswagen, Austin, Hillman and Renault class and are the product of 14 major factories.

These cars may properly be characterized as the European counterpart of our transportation machines, and in view of the low initial cost and operating economy desired they seem a suitable if not satisfying solution. Efficiency of the mass-producing auto plants in Europe is reported by some to be higher in many respects than our own. Austin, for example, is said to use automation in its final assembly, impossible to design-changing American automakers.

There seems little doubt that the European automakers are doing an excellent job within the sphere of their economic limitations. But it is sobering to contemplate their cars as products symbolic of the limitations which produced them.

How the Average European Car Compares with Chevrolet

	European	Chevrolet
Horsepower	42	105
Weight	2030	3400
Wheelbase	95	115
Track	50	58



Ford Goes Futuristic

The dream car notable for its name is the Ford FX-Atmos. Appropriately it was introduced in the windy city where Ford probably figured to air was human. The styling concepts are probes and could appear segmentally on some Ford cars within a few years, but to date Chevrolet has expressed no Atmos-fear

Twin Hydra-Matic for GMC

Two truck Hydra-Matic transmission units mounted over and under and governed to shift alternately with each other through seven forward speeds are announced by GMC Truck and Coach Division. Both units are geared together at the rear, driving a single output shaft connecting with a three-speed reduction unit.

This combination provides automatic gear shifting throughout three separate ranges labeled creeper, low and direct. That means 21 separate forward gear ratios and three in reverse which should result in greater efficiency and better operating economy accord-

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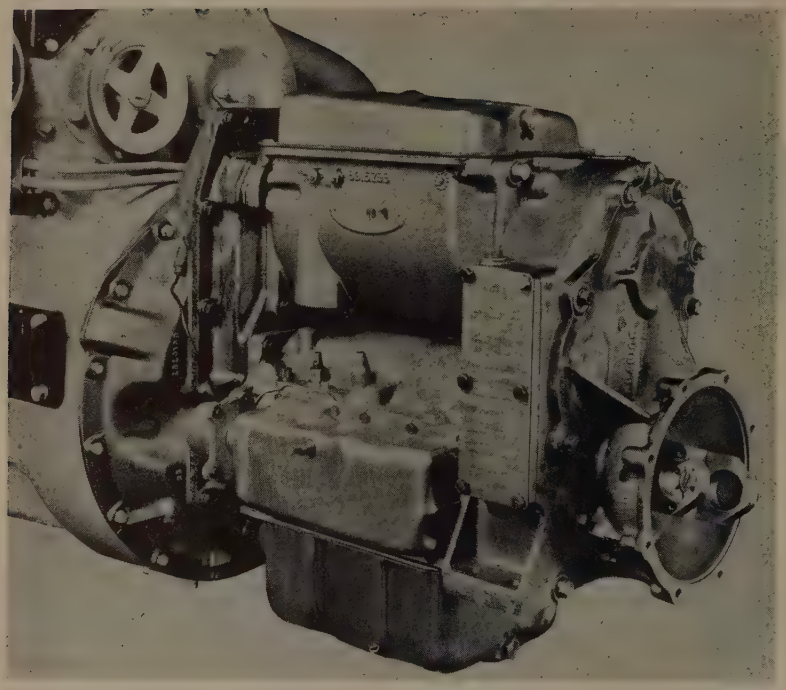

TWO-STORY TRANSMISSION

. . . twin Hydra-Matics provide versatility for G.M. diesel trucks

ing to Philip J. Monaghan, general manager of GMC.

The unit will first be available on GMC diesel model DFM-660-47, a cab-over-engine tractor rated at 60,000 pounds GCW. It will later be available in other 150-hp models and eventually will be engineered for use in conjunction with GMC's power plants in the 175-225-hp range.

GM Sales Hit All-Time High

General Motors Corp.'s sales reached an all-time high of $10 billion in 1953. Civilian sales of more than $8 billion were greater than combined civilian and defense sales for any other year, and defense sales of $2 billion were the largest since World War II.

Net income for 1953 was $598-million, or 6 per cent of net sales. Net income in 1952 was 7.4 per cent of the $7549 million sales.

The company is undertaking a program of capital expenditures calling for an outlay of $1 billion of which about 60 per cent will be accomplished in 1954 and the remainder in 1955. In a letter to stockholders, Harlow H. Curtice, president, and Alfred P. Sloan Jr., chairman of the board, called the program, "a measure of GM's confidence in the long-term future of the automobile industry and of the country."

GM car and truck sales in 1953 were half again as many units as in 1952.

Truck Muffler Rule Coming

Also of interest to truckers is an industry standard of muffler design recommended to all truckmakers by the Automobile Manufacturers Association. The standard, which would apply both to original equipment and subsequent replacement units, would establish a maximum permissible noise level and an agreed method of measuring exhaust noise.

Recommended measuring procedure, using the Beranek-Armour Equivalent Tone Method, was developed by the Armour Research Foundation last year at the Illinois Institute of Technology under terms of a grant from the American Trucking Associations.

Exhaust Notes

A convertible top actuator which automatically raises the top at the touch of a raindrop or a maiden's tear will shortly be offered by Ford Motor Co. as an approved accessory. A grid two by three inches makes contact to start the top motor through a control box mounted in the engine compartment. Price of the unit has not been announced.

An interesting device being experimented with by one Detroit automaker is a combination brake-accelerator control. Eliminating the shift from accelerator to brake with the right foot completely, the pedal is pivoted at the middle like a teeter-totter. Pressing with the toe applies the gas while rocking back on the heel puts on the brake which is power-actuated, permitting short travel. The one problem holding back production: Can the average individual change his habits suitably?

Now in the design stages is reported a Reo V-8 truck engine that should really be a honey. Only 25 inches long, 15 inches high and 20 inches wide, the engine incorporates a 4⅝-inch bore with 1⅞-inch-diameter exhaust valves and 2-inch-diameter intake valves. Also of interest are its five main bearings 3 inches in diameter. With an overhead valve setup similar to Cadillac, this mill ought to last Reo well into turbine-time and provide delightful hot rod fodder.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,821	628,017
March		752,474
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,818,108

Week Ended	1954	1953
Feb. 6	138,987	146,809
Feb. 13	142,097	147,103
Feb. 20	148,257	161,860
Feb. 27	145,980	167,779
Mar. 6	138,643	158,825
Mar. 13	144,000*	165,762

Source: Ward's Automotive Reports.
*Estimated by STEEL.

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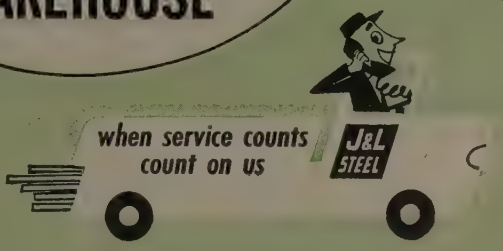

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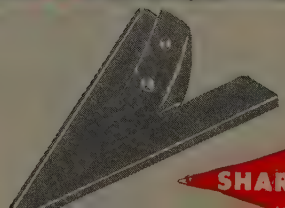

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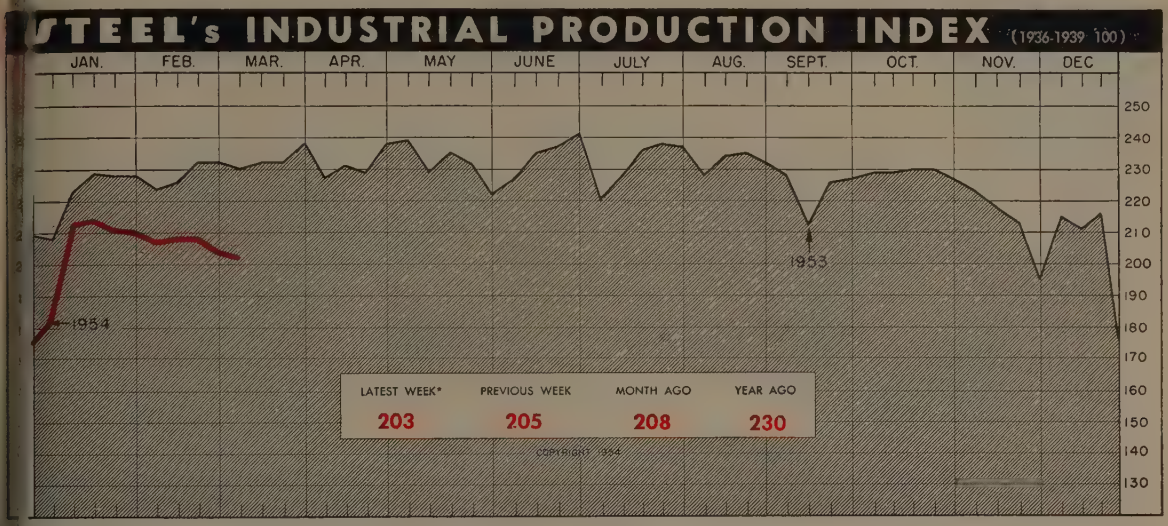


ek ended March 6

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

ise in New Orders: A Spring Tonic for Industry

SINESS is "looking up." Im-ovement is customary in the ringtime, and this year appears be no exception. Current im-us is provided by an increase in w orders, according to a survey de by the National Association Purchasing Agents.

The number of the poll's re-ondents reporting an increase in lings during February was eater than in January. More-er, the number of increases ex-tly balanced the number of de-eases, a condition that has not isted since last March, and was e highest since January, 1953.

easuring Business . . .

While new orders rose in Feb-ary, production, prices, inven-ries and employment continued decline. Full extent of the slide manufacturers' new orders, les and inventories during Janu-y has just been tabulated by the epartment of Commerce. The mmary reveals that new orders the first month amounted to 0.4 billion, $1 billion below De-mber and $4.5 billion under the me month a year ago. Sales in nuary of $22.9 billion were also $1 billion under the preceding month but only $1.1 billion below the year-ago level. Inventories of $46.8 billion, although showing a $100-million slide from December, were still above those of a year ago—to the tune of $2.1 billion.

Personal Income Is High . . .

Strong support for the economy was provided by the high level of personal income in January. Earnings during the month were at an annual rate of $282.5 billion, the Department of Commerce says. Although the January rate was $2.1 billion below the December average it was $2 billion above the January, 1953, level. But even in relation to December, Americans had a little more disposable personal income in January. Tax reductions account for the rise.

Farm Income Still Sliding? . . .

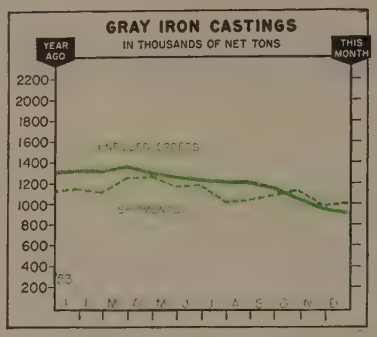
Farmers' income from all sources continued to slide last year, the Department of Agriculture reports. Estimated at $20.5 billion, farm income was the lowest since 1949 and 10 per cent under the 1952 level. Perhaps the downward trend will be slower this year.

Implement Buying Rises . . .

At any rate farmers seem to be increasing their purchases of farm equipment. J. L. McCaffrey, president, International Harvester Co., says that his company boosted output of farm implements and some tractors during January. This step-up followed a steady drop in dealer inventories and reports from dealers that sales had shown an increase in December and January.

Able To Repay . . .

The high level of personal income enabled Americans to make hefty repayments on their installment credit during January. At the end of the first month the amount of consumer installment credit outstanding totaled $21,444-million, the Federal Reserve Bank reveals. The total was $363 million less than at the preceding month end. It compares with an increase of $167 million in January of last year and with declines of $177 million in 1952 and $152 mil-

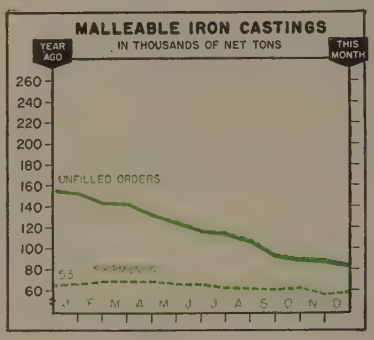


Gray Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1953	1952	1953	1952
Jan.	1,162	1,199	1,333	1,801
Feb.	1,136	1,155	1,332	1,766
Mar.	1,264	1,172	1,376	1,711
Apr.	1,277	1,205	1,306	1,614
May	1,186	1,101	1,272	1,459
June	1,196	835	1,246	1,445
July	1,056	636	1,233	1,410
Aug.	1,069	1,002	1,223	1,513
Sept.	1,106	1,119	1,170	1,451
Oct.	1,142	1,233	1,076	1,392
Nov.	1,004	1,061	977	1,309
Dec.	1,032	1,142	955	1,316
Total		13,660		

*For sale. U. S. Bureau of the Census.

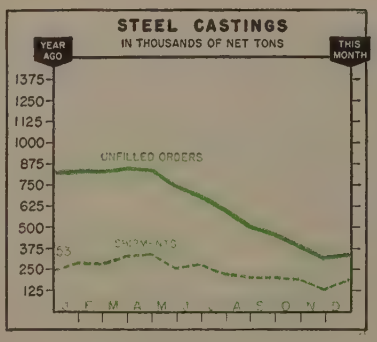


Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1953	1952	1953	1952
Jan.	87.2	87.0	174.8	203.0
Feb.	86.5	82.9	175.1	193.1
Mar.	94.5	81.0	177.8	196.9
Apr.	95.9	89.3	174.5	198.2
May	82.1	81.8	160.4	180.4
June	86.5	74.4	151.0	173.4
July	77.1	45.3	137.3	166.6
Aug.	73.9	63.7	120.8	162.8
Sept.	74.3	75.9	114.5	168.4
Oct.	73.5	88.1	104.0	168.6
Nov.	63.4	76.1	93.2	167.8
Dec.	72.1	80.6	95.6	173.5
Total		926.1		

*For sale. U. S. Bureau of the Census.

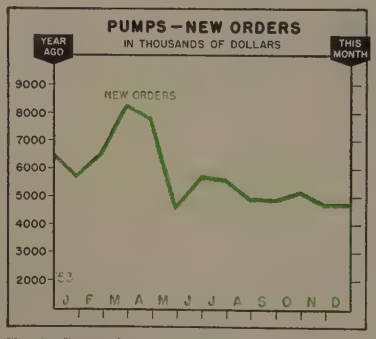


Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1953	1952	1953	1952
Jan.	167.2	193.7	706.5	869.3
Feb.	175.7	174.6	644.3	856.9
Mar.	182.2	173.7	634.6	857.1
Apr.	179.6	175.1	573.6	843.0
May	165.6	173.6	525.0	804.7
June	164.7	141.6	475.8	846.5
July	139.6	119.0	467.9	855.0
Aug.	141.3	150.2	418.9	809.4
Sept.	135.3	158.4	327.2	781.9
Oct.	140.7	165.2	313.7	772.9
Nov.	114.1	148.3	308.5	751.7
Dec.	123.3	161.7	278.4	719.2
Total		1,925.1		

*For sale. U. S. Bureau of the Census.



Pumps, New Orders

In Thousands of Dollars

	1953	1952	1951
Jan.	5,752	5,517	6,477
Feb.	6,521	6,020	6,480
Mar.	8,255	5,925	7,654
Apr.	7,758	6,354	7,583
May	4,629	6,140	6,371
June	5,690	7,957	6,852
July	5,533	6,299	8,358
Aug.	4,886	5,921	5,911
Sept.	4,845	5,258	6,552
Oct.	5,097	5,534	6,506
Nov.	4,634	4,130	5,908
Dec.	4,645	6,575	5,553
Total	68,245	71,630	80,175

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Feb. 22	Gears .....Feb. 15	Ranges, Gas .....Jan. 11
Durable Goods ..Dec. 14	Indus. Production..Feb. 15	Refrigerators .....Jan. 8
Employ., Metalwk..Feb. 22	Ironers .....Feb. 15	Steel Forgings ....Mar. 8
Employ., Steel ...Mar. 8	Machine Tools ....Mar. 8	Steel Shipments ...Jan. 11
Fab. Struc. Steel..Mar. 1	Prices, Consumer..Dec. 7	Vacuum Cleaners..Mar. 8
Foundry Equip. ..Mar. 1	Prices, Wholesale..Mar. 1	Wages, Metalwk...Mar. 1
Freight Cars .....Feb. 22	Radio, TV .....Feb. 22	Washers .....Feb. 15
Furnaces, Indus. ..Jan. 8	Ranges, Elec. .....Jan. 8	Water Heaters ....Jan. 11

tion in 1951. Present payments were largely for automobile loans.

Unemployment Claims Dip . . .

Unemployment, the most pressing problem on the economic horizon, continues to show signs of lessening. Claims for new unemployment compensation continue to show a general decline. Continued claims in the last few weeks have started to slide also. In the latest week continued claims in 11 highly industrialized states totaled 1,300,872. This was about 7000 claims below the preceding week.

Labor Disputes Reduced . . .

The present level of unemployment also seems to be acting as a deterrent to those who might otherwise have stopped work due to a labor-management dispute. In January all industries lost only an estimated 0.12 per cent of working time, according to the Department of Labor. This was 0.03 per cent less than in December and the lowest January percentage in many years. In terms of work days, an estimated 1 million were sacrificed.

Our Expanding Population . . .

The steady population increase not only creates more latent demand, but it also increases the number of persons seeking employment. It may be fortunate, therefore, that the number of young Americans wanting to start their working careers now is less than it has been during the last several years. On the other hand the rise in population to 161.1 million on Jan. 1, 1954, is creating latent demand at an undiminished pace. The 1.7-per-cent increase in population during the last year included a record number of births—4 million—and a record low in deaths—9.6 per 1000 population, the Bureau of the Census reports.

Unanticipated Building . . .

The population rise should solidly support a generally rising construction level. It's surprising however, that expenditures for new construction reached a record high for the month during February Military construction had been expected to decline. It did, but the

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,682	1,756	2,262
Electric Power Distributed (million kwhr)	8,586	8,396	8,173
Bitum. Coal Output (daily av.—1000 tons)	1,127	1,204	1,435
Petroleum Production (daily av.—1000 bbls)	6,310[1]	6,303	6,440
Construction Volume (ENR—millions)	$208.1	$225.7	$322.7
Automobile, Truck Output (Ward's—units)	138,643	145,980	158,825
TRADE			
Freight Car Loadings (unit—1000 cars)	610[1]	595	685
Business Failures (Dun & Bradstreet, no.)	223	204	180
Currency in Circulation (millions)[3]	$29,885	$29,838	$29,772
Dept. Store Sales (changes from year ago)[3]	−3%	+2%	+9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,533	$16,324	$19,056
Federal Gross Debt (billions)	$274.8	$274.7	$267.6
Bond Volume, NYSE (millions)	$18.5	$14.4	$17.8
Stocks Sales, NYSE (thousands of shares)	10,141	6,205	8,844
Loans and Investments (billions)[4]	$79.7	$79.9	$76.7
U. S. Gov't Obligations Held (billions)[4]	$32.5	$32.3	$31.0
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	202.6	201.3	223.6
All Commodities[7]	110.6	110.5	110.0
Commodities Other Than Farm & Foods[7]	114.3	114.3	113.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

ide was more than offset by an crease of nearly 50 per cent in mmercial building. Total expendi- res for the month amounted to .3 billion.

otivating Force . . .

The compound feature of electric ility growth—it takes electric- y to build machinery and appli- ces and electricity to run them terwards—looms large behind its ntinued expansion. As a result ectric output so far this year above the same period in 1952. ut the increase between compa- ble weeks this year and last has en sliding since January. During e latest week, electricity output 8396 million kilowatt-hours was ly 4 per cent above the compa- ble week in 1953, the Edison lectric Institute says.

tandard or DeLuxe . . .

The increase in automobile pro- uction schedules during March kes into account the customary pring upsurge in sales. Retail ales of 400,000 new cars in Febru- ry were 12 per cent above the receding month, according to *Ward's Automotive Reports*. Even o, sales during the month were 3,000 units below the comparable month last year. Moreover, this level of sales was not enough to reduce the record Jan. 31 stocks.

Railroaded! . . .

The railroad industry appears to have been hit the hardest by the economic slide. Decline in freight car loadings in January from the year-ago level has had a devastating effect on net income. The Association of American Railroads estimates that net earnings after interest and rentals during January amounted to $18 million, compared with $57 million in January, 1953. The greatest decline centered in the eastern district where the railroads had a deficit in net income of $1 million, compared with a net income of $19 million in January, 1953.

Still in High Gear . . .

Business volume of gear manufacturers in January reveals that American industry is still operating on a high level. Though volume declined 13.7 per cent from December to January, volume during the first month was indexed at 167.4 per cent of the 1947-1949 average. At this level, volume was 7 points above the comparable month in 1953.

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—if variations in physical characteristics are permissible.
—if fairly heavy oversize gauge variations are not objectionable.
—if the fabricating operations are not too complicated and do not require intricate expensive dies.
—if a fine surface finish is not essential.
—if a good base for paint or enamel is desired.
—if you do not object to some "square footage" loss due to oversize variation.
—then Sheet Coil will probably be the most economical material for the job.

CONSIDER THINSTEEL

—if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
—if you wish to keep die wear low, no oversize gauge variations.
—if you require a fine finish or a better base for plating.
—if you want maximum yield for "most finished parts per ton."
—if you want selected tempers for maximum strength and lightest weight.
—then you'll find Thinsteel the most economical material by far.

No Argument Here.... Kenilworth Stocks Both

You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

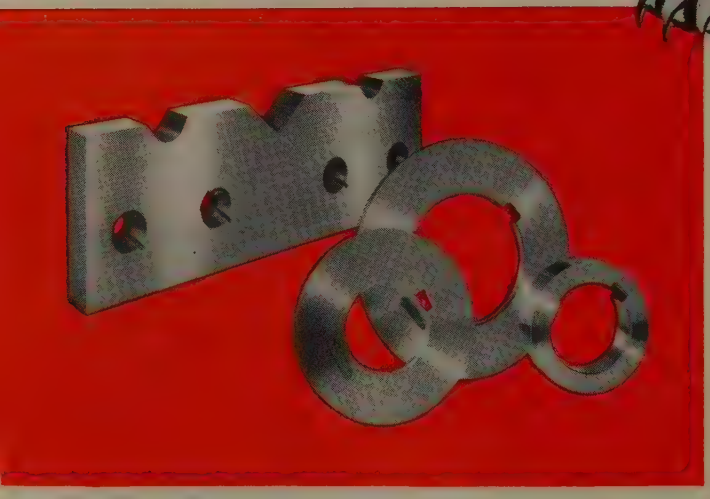
THE Kenilworth Steel Co.
750 BOULEVARD,
KENILWORTH, NEW JERSEY

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

Telephones: N. Y. COrtlandt 7-2427
N. J. UNionville 2-6900
Teletype: Roselle, N. J., 387

built for
rugged action

Heppenstall SHEAR KNIVES
***durable blades* for industry**



Many leading plants make Heppenstall their standard specification for shear knives. Heppenstall's record for durability provides such production advantages as:

- **MORE CUTS BETWEEN GRINDS**
- **MORE UNITS PER BLADE**
- **LOWER OVERALL BLADE COST**
- **INCREASES IN PRODUCTION**

The reasons may be found in Heppenstall's high standards for the development and manufacture of shear knives. Made from high quality, electric induction steels, the long-lasting knives are famous wherever hot and cold, ferrous and non-ferrous metals are cut and sheared.

Make Heppenstall *your* standard specifications.

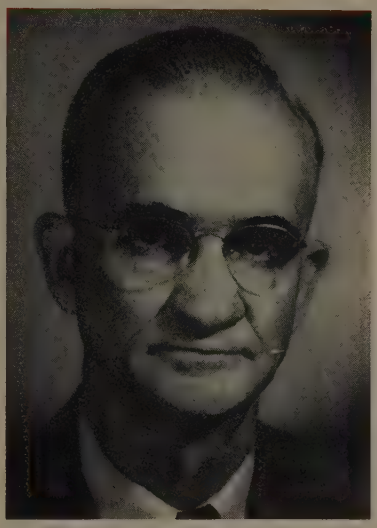
Heppenstall

The most dependable name in forgings

PITTSBURGH 1, PENNSYLVANIA

Sales offices in principal cities

R. A. MILLER
. . . mfg. manager for GE locomotives



RUBERT CAPLEY
. . . chief engineer of Timken div.

FRANK J. COUGHLIN
. . . N-B-P director of purchases

A. Miller was named manager manufacturing of **General Elec**ic Co.'s locomotive and car equipent department at Erie, Pa. Asciated with GE since 1923, he s served at Erie in several ca.cities. In January, 1952, he was ppointed superintendent of conol manufacturing and in August that year was made manager of e employee relations section.

W. Jordan was appointed vice resident, Pacific region, **Linde Air roducts Co.**, a division of Union arbide & Carbon Corp. His headuarters will be in San Francisco.

ouis E. Wolfson, chairman and resident, Merritt-Chapman & cott Corp., New York, and **Lewis 1. Schott**, vice president, have een elected to similar posts with **Newport Steel Corp.**, Newport, Ky., in which Merritt-Chapman as acquired controlling interest. **Carl M. Riefkin, A. P. Miller** and **Adolph H. Schenkel** continue as Newport vice presidents, and **H. E. Hamilton** and **Frank M. Cobourn** s treasurer and secretary, respecively. New directors are Mr. Wolfson, Mr. Schott, **Elkin B. Gerbert** and **Alexander Rittmaster** who also are on the Merritt-Chapman board. **William J. Mericka** continues as fifth board member. As board chairman and president of Newport Steel, Mr. Wolfson succeeds **Frank S. Gibson Jr.**

Rubert Capley succeeds **Walter J. Assel**, retired, as chief engineer, steel and tube division, **Timken Roller Bearing Co.**, Canton, O. Mr. Capley is replaced as assistant chief engineer of the division by **James T. Cook.**

John F. Romans was appointed to the central staff of **Eaton Mfg. Co.** at Cleveland. His initial assignment will include inspection of capital equipment, methods and processing of Eaton plants in Ohio, Michigan, Wisconsin and Ontario, Canada. During the last seven years Mr. Romans directed engineering and manufacturing at Motch & Merryweather Machinery Co.

James K. Sedgwick was appointed assistant manager of merchant products sales for **American Steel & Wire Division**, Cleveland, U. S. Steel Corp.

Robert A. Rohn was transferred from Cleveland to San Francisco as assistant manager of the San Francisco district sales office, **Aluminum Co. of America**, a newly created position.

Charles A. Grim was appointed assistant product manager, cold-rolled division, **Crucible Steel Co. of America**, Pittsburgh. His duties include sales service and sales development work with the firm's eastern branches.

Frank J. Coughlin was appointed to the newly created post of director of purchases, **Niles-Bement-Pond Co.**, West Hartford, Conn. He will direct purchasing of both the Pratt & Whitney and Chandler-Evans Divisions.

Campbell Chain Co., York, Pa., appointed **Albert A. Hally** general sales manager. He formerly was sales manager, Dennison Mfg. Co., Cleveland.

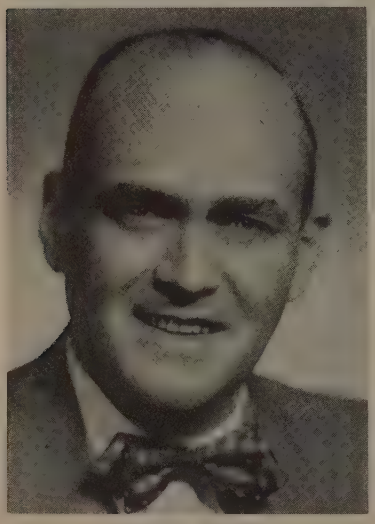
James J. Munns was elected vice president of **National Steel Corp.**, Pittsburgh, in charge of research and quality control. He has been identified with National Steel since 1935, serving in research and related capacities with various subsidiaries of the company.

Willys Motors Inc's aluminum forge division at Erie, Pa., promoted **Walter E. Streeter** to general manager, **Andrew M. Mitchell** chief engineer and **Robert C. Heiden** production superintendent.

Joseph L. Hochman, engineer and management consultant, was named production manager of **Schacht Steel Construction Inc.**, New York.

At **Republic Steel Corp.'s** Warren, O., district coke plant, **James H. Kunkle** was made superintendent. He formerly served as superintendent of Republic's Troy, N. Y., coke plant. Before joining Republic

LOUIS W. OLSEN JR.
. . . Grindle Corp. purchasing agent



PRENTICE BORDEN
. . . Lewis-Shepard v. p.-works mgr.

H. J. KALBERKAMP
. . . Mesta Machine chief engineer

at Troy in 1951, Mr. Kunkle was associated with Koppers Co., Pittsburgh, for nine years as chief operating engineer.

Grindle Corp., Harvey, Ill., appointed **Louis W. Olsen Jr.** purchasing agent. Mr. Olsen has had seven years of experience in the foundry industry.

Harold E. Morey was appointed director of sales, **Midland Co.**, South Milwaukee, Wis. He formerly was with Studebaker Corp. as assistant director of owner relations.

Stuart K. Oliver was appointed sales manager, **Rawlins Bros. Division**, Solar Steel Corp. of California. His office is at the Solar plant, South Alameda street, Los Angeles. Mr. Oliver has been closely associated with manufacturers of southern California for the last six years as an adviser on metallurgical problems as well as sales.

Fulton Co., West Allis, Wis., named **A. L. Fulton** president and treasurer, **James Toussaint** vice president and assistant treasurer, **J. N. Johnson** secretary and **R. K. Smith** assistant secretary.

Prentice Borden was appointed vice president and works manager, **Lewis-Shepard Products Inc.**, Watertown, Mass., which he joined Jan. 1, 1954. He is managing the engineering, purchasing and manufacturing operations of factories at Watertown and at Crawfordsville, Ind. Before joining **Lewis-Shepard**, Mr. Borden was president of Crescent Truck Co. Other appointments include **George C. Shepard** as assistant works manager, **Herbert W. Merrow** as general superintendent and **Robert L. Buckley** as production manager.

H. J. Kalberkamp was appointed chief engineer, **Mesta Machine Co.**, Pittsburgh. Associated with Mesta for 28 years, he has served most recently as division engineer, proposal department.

Raymond H. Bish fills the newly created position of manager of manufacturing services and facilities of Electro-Motive Division, **General Motors Corp.**, La Grange, Ill. **George D. Baker** was named manufacturing manager for Plant 1 with operational responsibilities for engine, transmission and locomotive divisions. **David R. Kendell** was made manufacturing manager for rebuilding locomotive components.

Carl R. Wettereau was made manager of the newly established test and handling equipment division of **Pacific Airmotive Corp.**, Burbank Calif. For the last ten years he has been assistant chief engineer of Greer Hydraulics Inc.

William T. Martin, formerly manager of the Indianapolis office, was transferred to the **Landis Tool Co.** home office in Waynesboro, Pa. He is replaced at Indianapolis by **John Mourer**, formerly head of the Pittsburgh office. **Eckley Schatzman** takes charge of the Hartford, Conn., office to succeed **John Schobinger**, who has joined the sales staff of Gardner Machine Co.

Robert Oster, executive vice president, **John Oster Mfg. Co.**, Milwaukee, will be in charge of sales for the aviation division. **Stanley J. Zak**, former aviation division sales manager, has resigned.

Frank B. Snedecor, comptroller, Titanium Alloys Division, **National Lead Co.**, Niagara Falls, N. Y., was promoted to assistant to the manager of the division. He continues as comptroller.

Victor Frederiksen was appointed to the newly created post of chief industrial engineer, **Dodge Division**, Chrysler Corp., Detroit. He has been plant engineer at Dodge since September, 1952. In that position he is replaced by **Albert L. Wilson.**

Harvard K. Hecker was elected vice president in charge of engineering, **Curtis Mfg. Co.**, St. Louis.

Ray J. Fellows, for the last six years assistant sales manager, **Wisconsin Motor Corp.**, West Allis, Wis., was promoted to sales manager. **J. W. Perschbacker** was made assistant sales manager.

Donald B. Kendall was made assistant to the director of engineering at **Toledo Scale Co.**, Toledo, O.

Robert H. Wilkie was appointed supervisor of sales promotion for **New Departure Division**, General Motors Corp., Bristol, Conn. He will be responsible for advertising and will co-ordinate sales forecasts,

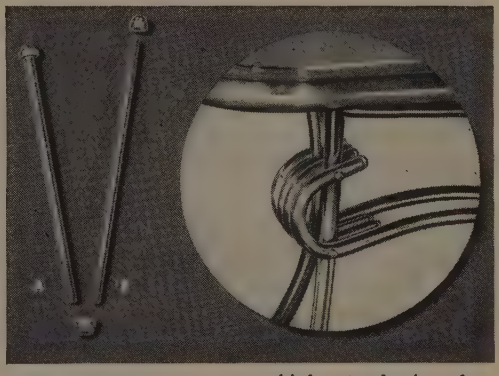
RB&W cold-forming pays off again

Virtue Brothers of Los Angeles sells a lot of these chrome dinette sets. They're good-looking, well-made, easy to keep looking like new.

However, Virtue Brothers believed assembly costs were running high. So they listened hard when an RB&W "fastener engineer" told them RB&W could cut by one-third their cost of buying and installing the steel studs with acorn nuts which hold the table legs together (see inset below).

And we did. By cold-forming an acorn head at one end of the 5-inch stud, RB&W eliminated one of the two separate nuts Virtue had been using. This halved assembly costs, as well as nut inventory. RB&W's cold-formed unit plus assembly runs $27.15 a thousand as against former costs of $41.00 a thousand — which works out to more than a pretty penny saved on a production-scale operation.

What an RB&W man did for Virtue Brothers, he can do for you. Because we make all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. Write RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y.



CUSTOMER'S REWARD was a one-third cost reduction when RB&W designed a cold-formed two-piece fastener (A) to replace the three-piece unit (B) formerly employed to secure table legs (right). 3.9

RB&W

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*

S. K. HOSTETTER JR.
. . . Crocker-Wheeler gen. mgr.

A. BARR COMSTOCK JR.
. . . Pittsburgh Screw & Bolt sales mgr.

RUSSELL W. BILL
. . . Shakeproof sales mgr.

market research and sales training. **Matthew C. Wagner** was made supervisor of sales training, a newly created position.

S. K. Hostetter Jr., sales manager of Elliott Co.'s **Crocker-Wheeler Division** for the last year, was named general manager. He joined Elliott Co., Jeannette, Pa., in 1934. Before joining Crocker-Wheeler he had been in the company's Washington office, first as a field engineer and later as district manager.

At **George D. Ellis & Sons Inc.**, Philadelphia, **H. K. Taylor**, chairman and treasurer, and **C. W. Morgan**, senior vice president, retired. Both remain as directors of the firm. **J. Earl Cobourn**, personnel manager, will serve also as treasurer. **L. Crampton Sossaman**, vice president in charge of sales for Myers Mfg. Division, was made vice president and general sales manager of Ellisco.

John C. Udd was appointed director and **Arthur J. LeBlanc** general manager of **Toronto Iron Works Ltd.**, Toronto, Ont.

Pittsburgh Screw & Bolt Corp., Pittsburgh, named **A. Barr Comstock Jr.** general manager of sales with headquarters in Pittsburgh. He joined the firm in 1946 as a sales representative in the Philadelphia district and became sales manager of that district in 1950. **Charles M. Sutlive** assumes the latter position. He formerly served as southeastern district sales manager and was located in Savannah, Ga.

Appointments in the sales department of **Weirton Steel Co.**, Weirton, W. Va., a division of National Steel Corp., include: **W. A. Fannin**, assistant to the vice president; **C. H. Hesse**, assistant vice president in charge of sheet and strip sales; **R. S. Meighen**, assistant vice president in charge of tin mill products sales; **E. W. Gescheider**, general manager of sales; **F. G. Brown**, assistant general manager of sales; **J. W. Taylor**, manager of sales, tin mill products; **H. C. Fitton**, manager of sales, sheet and strip sales; and **J. H. Swisher**, acting district sales manager, Cincinnati.

Russell W. Bill was appointed sales manager, **Shakeproof Division**, Illinois Tool Works, Chicago. Mr. Bill started with Shakeproof in 1935 as a salesman for the upper New York territory, a position he held until 1950 when he was promoted to eastern district manager. Executive offices of Shakeproof are located in Elgin, Ill.

John F. Pendergast, former sales promotion manager of the road machinery division, Heil Co., was appointed general manager, **Contractors Machinery Co. Inc.**, Batavia, N. Y. He will be in charge of both domestic and export sales for the firm.

Duncan W. Fraser retired as chairman of the board of **American Locomotive Co.**, Schenectady, N. Y. The company announces the office of chairman has been discontinued.

Roger W. King is manufacturers' representative for **Horton Chuck Division**, E. Horton & Son Co. Located in Meriden, Conn., he will serve upper New York and eastern Canada.

OBITUARIES...

Michael C. Pecsok, 57, an officer of **Osborn Mfg. Co.**, Cleveland, for nearly a decade, died Mar. 1. Since 1945 he had been a vice president-sales and marketing.

William J. Brinkerhoff, who retired from the **United States Steel Export Co.**, New York, in October, 1952, died Feb. 25 while vacationing in Florida.

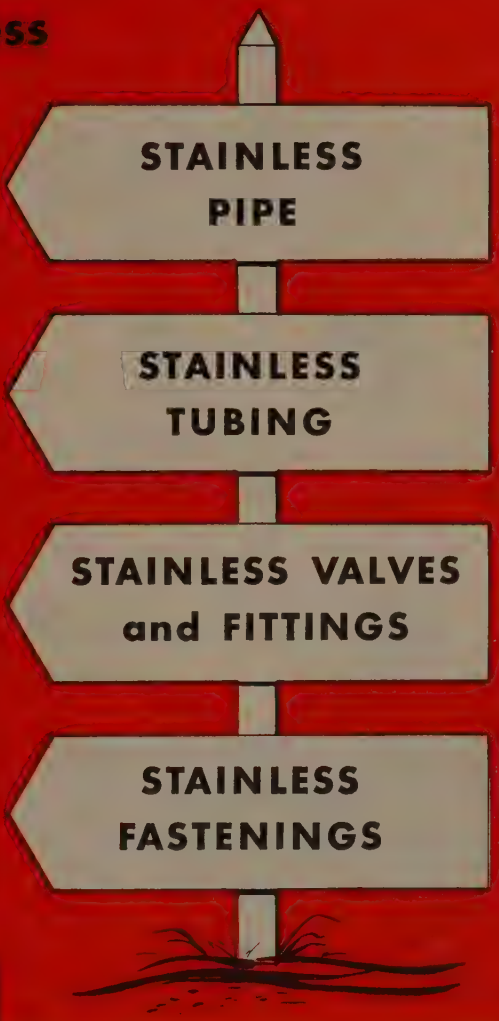
E. T. Wilson Jr., 48, sales representative, tubular products division, **Babcock & Wilcox Co.**, died in Portland, Oreg., Feb. 24.

Guy M. Polhemus, 60, owner of **Central New York Foundries Inc.**, Manlius, N. Y., died Feb. 27.

Thomas J. Myer Sr., 66, a retired sales executive, **Budd Co.**, Philadelphia, died Feb. 28. He played a prominent part in the production of the early all-steel auto body.

If it's STAINLESS...

The House of Stainless Has It!



Stainless pipe, tubing, valves, fittings and fastenings are only a few of the stainless items carried in stock for immediate delivery at the House of Stainless.

True to our name, we provide a dependable source for all your stainless needs, whether it's sheets, plates, bars, shapes or miscellaneous items, such as welding rod, expanded or Rigidized metal.

And don't forget—you can also look to Chicago Steel Service for your carbon steel requirements.

For prompt shipment, call LAfayette 3-7210, or contact our office nearest you. Either way, you can count on dependable service.

The House of Stainless
STEEL AT YOUR SERVICE STEEL

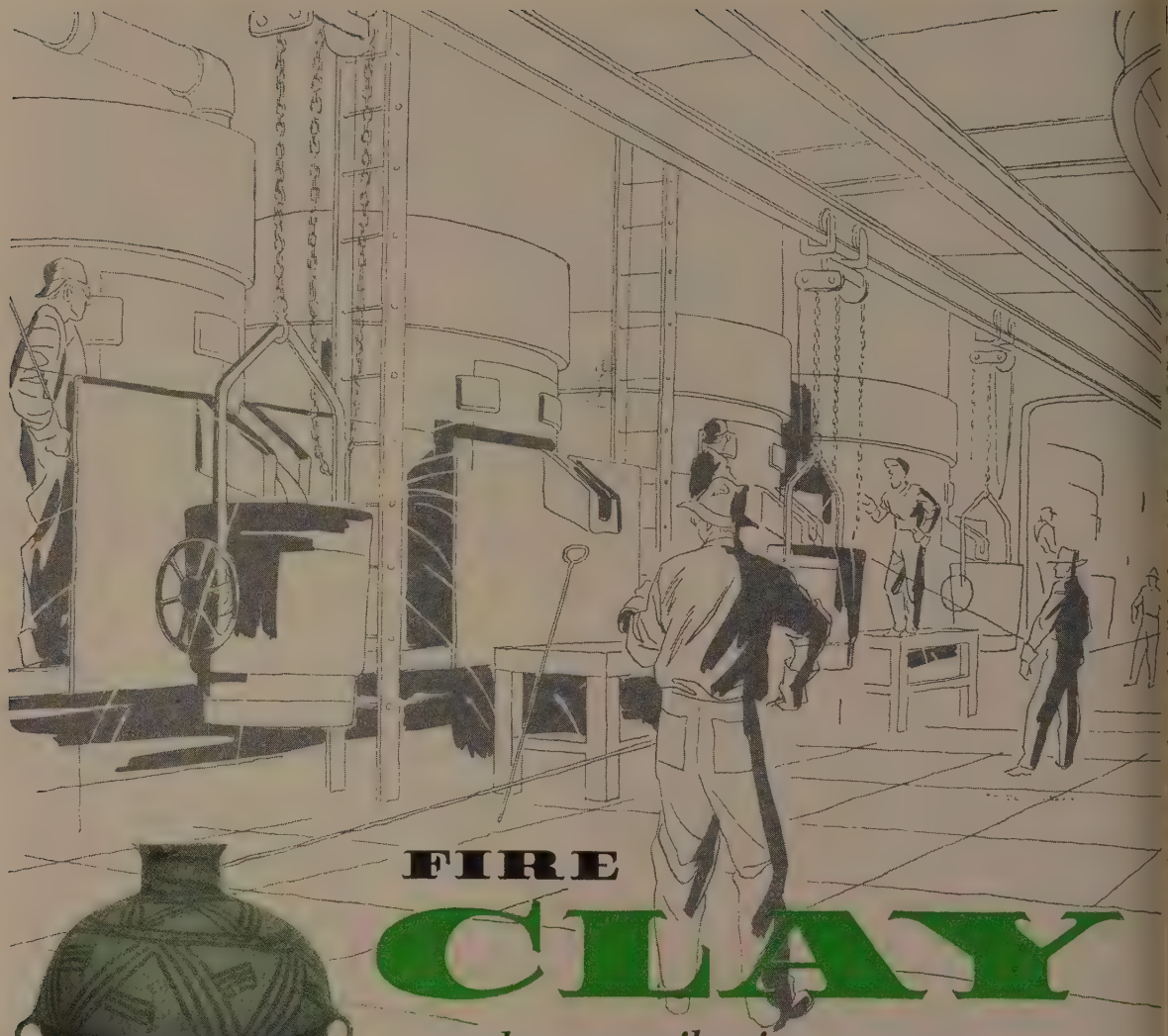
CHICAGO STEEL SERVICE COMPANY

Kildare Avenue at 45th Street, Chicago 32, Illinois · Telephone: LAfayette 3-7210

MILWAUKEE DISTRICT OFFICE
757 North Broadway, Milwaukee 2, Wisconsin
Telephone: BRoadway 2-7874

MINNEAPOLIS DISTRICT OFFICE
3501 Hennepin Avenue, Minneapolis 8, Minnesota
Telephone: Colfax 2602

Sales Representatives at Bloomington, Moline and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids, Iowa; Grand Rapids, Michigan; Fond du Lac, Wisconsin.



FIRE CLAY

...ageless contribution to man

through Art

Over the centuries, man has found fire clay an ideal medium to express his artistic faculty. Illustrated here is an example of ancient fire clay use . . . a painted jar* found in graves belonging to New Stone Age People who lived in northwest China *more than 3,500 years ago.*

through Industry

Modern civilization calls on fire clays in another, yet a most fundamental way . . . to serve great industries in their quest to conquer and utilize heat. For without fire clay refractories, industrial furnaces could not produce the many tons of steel, iron and other metals so indispensable in today's economy.

A leading source of fire clay refractories is:

ILLINOIS CLAY PRODUCTS COMPANY

SALES OFFICE: 208 S. LA SALLE ST., CHICAGO, ILLINOIS
MAIN OFFICE: BARBER BUILDING, JOLIET, ILLINOIS

MANUFACTURERS OF GOOSE LAKE AND CHEM-BRIX REFRACTORIES AND THERM-O-FLAKE INSULATION

* *Courtesy Chicago Natural History Museum*

to Enlarges Equipment

Concentrator capacity raised 20 per cent to meet military and civilian demand for nickel

PACITY of the concentrator at Creighton mine of International Nickel Co. of Canada Ltd. s enlarged to 12,000 tons of per day. The development, ich adds 20 per cent to the con- trator capacity, is a step in o's program of providing max- im nickel production for the re- rements of the free world. Two ashers were added to the origi- four and 36 floatation machines re added, bringing the total to).

Capacity of the mill, in which kel-copper ore is separated from k before smelting, has been en- ged twice in response to in- eased nickel demand for defense d civilian requirements, says J. y Gordon, vice president and neral manager of the Canadian erations.

When it was designed in 1948, was to have a daily capacity of 00 tons, but plans were changed 1950 to enable the mill to ac- mmodate 10,000 tons of ore per y. The new capacity of 12,000 ns is, therefore, double that ich was planned originally.

International Nickel is producing fined nickel presently at an an- al rate of about 275 million unds.

lar Steel Builds in East

Solar Steel Corp., Cleveland, arehouser and fabricator, has arted construction of a 70,000- ft plant in Sparrows Point, Md. lar maintains plants at Chicago, ncinnati, Cleveland, Detroit, iladelphia, River Rouge, Mich., d Union, N. J. Sol Friedman is esident.

ompiling Equipment Directory

Equipment manufacturers whose oducts were omitted from the 51 issue of the Defense depart- ent's directory of *Metalworking achinery* should write to the Pro- uction Equipment Branch, Office Assistant Secretary of Defense r Supply & Logistics, Washington 5, for forms and instructions. A new edition of the directory, which is extensively used by the armed services for procurement and inventory purposes, is about to be compiled.

Enters Television Field

Canadian Fairbanks-Morse Co. Ltd. entered the television manufacturing field and is now producing receivers in a Toronto, Ont., plant. The firm has been identified with industrial and engineering products.

Lindberg Moves Detroit Branch

Lindberg Engineering Co., Chicago, moved its Detroit office, managed by Frank J. Condit, to 1220 S. Woodward Ave., Royal Oak, Mich.

Wire Rope Firm To Shift Unit

E. H. Edwards Co., wire rope manufacturer, will move its Wire Fish-Netting Mfg. Division from Ketchikan, Alaska, to its main plant in South San Francisco, Calif. The Alaskan plant will be closed down at the end of the current manufacturing season. A new building has been built at South San Francisco to accommodate the division upon its removal there.

Union Wire Opens Branches

Union Wire Rope Corp., Kansas City, Mo., opened a branch office and warehouse at 845 Mumford St., Pittsburgh, with R. K. Cooke as district manager and at 238 N. Delaware, Philadelphia, with D. E. Bedford as district manager.

Ames Appoints Representative

B. C. Ames, Waltham, Mass., manufacturer of micrometer dial indicators and gages, appointed J. B. Morrison Machinery Co. Ltd., Toronto, Ont., as its Canadian representative.

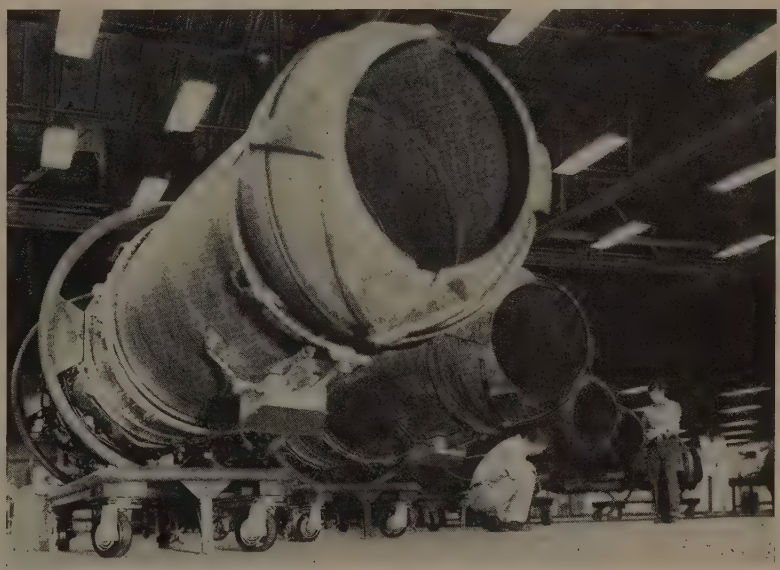
Warren Refining Expands

Warren Refining & Chemical Co., Cleveland, expanded its plant facilities, doubling its capacity for producing lubricants.

Timken Forms Mexican Company

Timken Roller Bearing de Mexico, Mexico City, is a new company formed to handle the sale of products manufactured by Timken Roller Bearing Co., Canton, O. These products include tapered roller bearings, removable rock

(*Please Turn to Page* 88)



Waiting For a Chance To Show Their Stuff

Jet engines line up for final testing at General Electric Co.'s jet center in Evendale, O. These J-47-17 turbojets will power North American F-86-D interceptors, one of which recently set a world speed record at 715.7 mph. After-burner (facing camera) in which additional fuel is burned adds more thrust

(Advertisement)

1. **THESE LARGE REELS** of steel wire are manufactured to the exact specifications of the Roto-Rooter Corporation. Here Roto-Rooter employee Glen Anderson operates an electric hoist to transfer a reel of wire to the coil forming machine, where it is formed into one of the various sizes of flexible cable used in the Roto-Rooter machines.

2. **ILLUSTRATED HERE** is the coiling machine which is used to place the bulk cable coming from the coiling machine into the Roto-Rooter machine reels.

"That AS&W wire is really wire!"

says R. A. YOUNG,

Secretary of the Roto-Rooter Corporation, Des Moines, Iowa

"Our business is making machines*—a special sewer and drain-cleaning machine called the Roto-Rooter. Strict specifications are followed in the manufacture of the Roto-Rooter, especially in the flexible steel cable which is the heart of the machine. That cable must be really tough — strong enough to withstand the acute twisting action of the revolving reel, flexible enough to negotiate the sharpest bends and turns, highly resistant to the corrosive elements found in all sewers. That cable absorbs a terrific beating, and naturally it must be fabricated from an especially high grade steel wire.

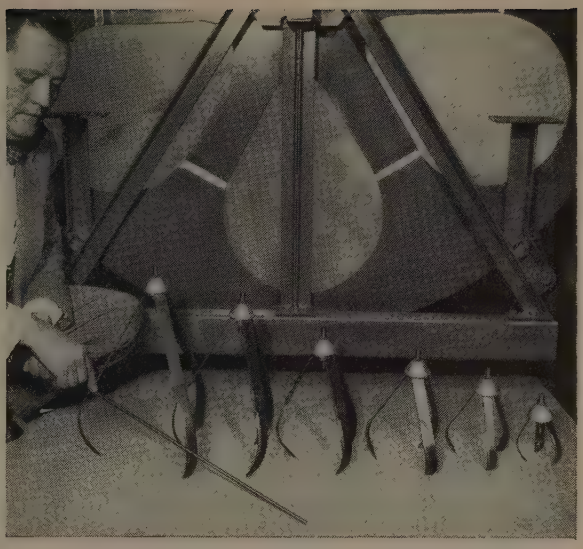
"We found the kind of wire we need at American Steel & Wire. Our engineers got together with the AS&W metallurgists, working out the heat treating and hardness specifications. The wire we get from AS&W is made especially for us, and is not used by any other manufacturer. One of the things we like best about AS&W is their constant adherence to our close-tolerance specifications. And we're more than satisfied with the terrific performance of the steel wire in our machines. That AS&W wire is *really* wire!"

• • •

The experience of the Roto-Rooter Corporation is not unusual. Thousands of manufacturers all over the country have learned to depend on the consistently high quality of USS American Manufacturers Wire. A better-grade steel wire enables you to do a better fabricating job . . . and often saves you money, too.

American Steel & Wire carries, *in stock,* over 400 different types of American Manufacturers Wire, including Stainless, for you to choose from. For special requirements, our trained staff will work with you to develop a new wire that will meet your specifications exactly. Why not let us help you with *your* steel wire problems? If you make it of wire, make it of the best—USS American Manufacturers Wire.

3. EMPLOYEE J. B. THOMAS is shown attaching the steel cutting blades to flexible steel cable on the Roto-Rooter machine. The revolving reel shown on the right housed 120′ of this ¾″ AS&W steel cable. In the background can be seen the stockpile of finished cables ready for installation in the machine.



4. N. W. LARSEN of the Roto-Rooter Corporation shows the various sizes of Roto-Rooter cutting blades. In operation, the blades are attached to the end of the flexible cable and receive their cutting motion from the revolving reel at the opposite end through the steel cable.

5. AND HERE'S a finished Roto-Rooter in operation with the cutting blades about to be inserted into the sewer line. The razor sharp, high-speed rotating blades cut all roots, grease, scale, and other debris into tiny pieces, leaving the line as clean as the day it was installed. The specially-designed steel cable has to absorb a terrific beating in negotiating the sharp turns and bends found in domestic sewer lines—as high as four or five 90° turns in one operation. It's easy to see why the Roto-Rooter Corporation insists on the highest standards of quality in the steel wire they use in these cables . . . and why they use American Manufacturers Wire exclusively.

*Roto-Rooter is a nationwide sewer service and Roto-Rooter machines are placed only on an exclusive franchise basis.

If you make it of wire...
make it of the best!

USS AMERICAN MANUFACTURERS WIRE

AMERICAN MANUFACTURERS WIRE

AMERFINE—*High-quality fine wire.*

AMERSPRING—*music steel spring wire.*

AMERLOY—*alloy heading wire.*

AMERTEMP—*heavy-duty oil-tempered wire.*

AMERHEAD—*uniform heading wire.*

AMERSTITCH—*extra-tough metal stitching wire.*

USS

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

(*Continued from Page* 85)

bits, fine alloy steel bars and billets, and seamless steel tubing. A. E. Porter is manager of the new company.

Hanchett Opens Plant

Hanchett Mfg. Co., Big Rapids, Mich., opened its new West Coast plant and warehouse at 5727 S.W. Macadam Ave., Portland, Oreg. The company makes saw sharpening and knife grinding machinery and accessories. H. E. Darling is West Coast manager.

Enters Steelmaking Field

Hunt-Spiller Mfg. Corp., South Boston, Mass., has entered the steel manufacturing field. The company has been making castings. It has extensively modernized its existing plant facilities for production of high quality steel in electric furnaces. Its metallurgical laboratory has been expanded.

Abbey Drum Co. Building

Abbey Drum Co. is erecting a plant, containing 10,500 sq ft, in Curtis Bay, Md. It will engage in the reconditioning of steel drums. Nelson Neuman is owner.

Bendix Plans Expansion

Bendix Radio Division, Bendix Aviation Corp., Towson, Md., purchased 25 acres on the south side of Joppa road, directly opposite its main plant. Land will be used for expansion of present facilities, but plans for new construction will not be completed before early fall. Edward K. Foster is general manager.

Dow Corning Silicones Moves

Dow Corning Silicones Ltd., recently organized subsidiary of Dow Corning Corp., Midland, Mich., moved into its new office and warehouse building on Tippet road, Wilson Heights, Toronto, Ont. The new company has taken over the sales, service and warehousing operations formerly carried on by Fiberglas Canada Ltd. as Canadian distributor of Dow Corning products. D. C. R. Miller is general manager of the new company.

New Name for ACF?

American Car & Foundry wants to be known as ACF Industries Inc. to keep up with expansion

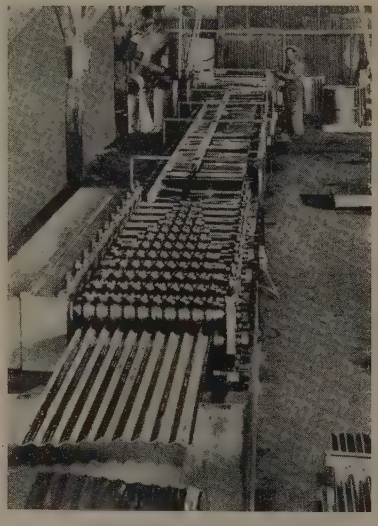
STOCKHOLDERS of American Car & Foundry Co., New York, will vote Apr. 15 on a proposal to change the name of the company to ACF Industries Inc. They also will act upon a proposal to change, readjust, reclassify and increase the company's capital stock.

The proposed name is more properly descriptive of the company's present business and future objectives, the management says. In view of the company's growing business in fields which did not exist when it was incorporated in 1899, such as aircraft, atomic energy and electronics, the present name is no longer appropriate.

"Furthermore, it may become desirable in the future . . . to merge or integrate certain of the present subsidiaries of the company," the management adds. "The new name and the proposed restatement of the company's powers will, it is believed, more accurately describe and reflect the company's present and future activities. . . . The company has steadily pursued a policy of expanding and diversifying its activities, both directly and through subsidiaries, in order to stabilize its earnings and to consolidate its position in American industry. It is our intention to continue this policy and to intensify it . . ."

Present subsidiaries of American Car & Foundry Co. are Carter Carburetor Corp., manufacturer of carburetors; Shippers' Car Line Corp., which owns and operates through leases to industrial corporations railroad tank cars; SHPX First Corp. and affiliated corporations, which are engaged in leasing railroad cars; and Avion Instrument Corp., engaged principally in research and development work in the electronics industry.

A recently organized division of the company is known as ACF Electronics. This division in Alexandria, Va., consists of five sections, each specializing in one branch of electronic research and product development.



Kyle Broadens Service

New rolling mill recently installed by Kyle & Co., Fresno, Calif., distributor of steel and metal products, is shown rolling out cut-to-measure lengths of corrugated galvanized sheet steel. It is capable of producing lengths of steel from 4 ft to 25 ft

Plans $30-Million Project

Consolidated Gas Electric Light & Power Co., Baltimore, will spend about $30 million for new plant and extensions this year. The major project, now under way, is a 125,000-kw steam-electric generating plant at Marley Neck, Md.

Taft-Peirce Names Agent

Taft-Peirce Mfg. Co., Woonsocket, R. I., appointed Kel-Sir Co., Milwaukee, as its agent in that territory. Taft-Peirce makes gages, small tools and machine tools.

Forms Canadian Subsidiary

Hapman Conveyors Inc., Kalamazoo, Mich., appointed Canadian Vickers Ltd., Montreal, Que., a Canadian manufacturer and distributor of its chain tubular conveyors.

Corrosion Engineer Honored

National Association of Corrosion Engineers, Washington, selected Dr. I. A. Denison of Diamond Ordnance Fuze Laboratories, that city, to receive the 1954 Willis Rodney Whitney award in recognition of his outstanding contributions to the science of corrosion. The cere

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IRON and STEEL
***Need* PROTECTION**

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

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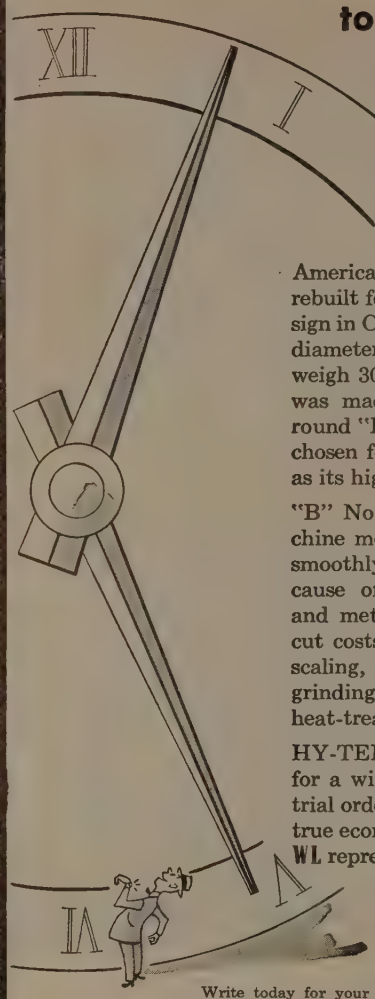
HY-TEN

ALLOY STEEL



America's largest clock was recently rebuilt for a spectacular illuminated sign in Chicago. It measures 50 ft. in diameter — hands and movement weigh 3000 lbs. The new driveshaft was made from 6 ft. of 3½-inch round "B" No. 3X heat-treated bar, chosen for its machinability as well as its high physical properties.

"B" No. 3X heat-treated bars machine more readily and finish more smoothly than standard alloys because of their particular analysis and method of manufacture. They cut costs by eliminating distortion, scaling, straightening — and often grinding — as well as the cost of heat-treating finished parts.

HY-TEN "B" No. 3X bars are used for a wide range of applications. A trial order will convince you of their true economy. Just call your nearest WL representative.

Write today for your FREE COPIES of Wheelock, Lovejoy Data Sheets, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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mony will take place at the tenth annual conference and exhibition to be held Mar. 17 in Kansas City, Mo.

Aluminum Fabricator Expands

Washington Aluminum Co. Inc., Arbutus, Md., aluminum fabricator, is erecting an engineering building, containing about 3000 sq ft of floor space. Located near the main plant, this will provide the company with a total of 38,000 sq ft.

Stevens Forms New Districts

Frederic B. Stevens Inc., Detroit, created two new district sales offices. For the company's Foundry Sales Division, the Indianapolis office and warehouse will be the center of activities for the central states district with Vince Bruce acting as district sales manager.

For the company's Metal Finishing Division, the district sales headquarters will be in Dayton, O., with warehouse facilities in Springfield, O. Harry Brown was promoted to the position of district sales manager for this area.

Feedrail Names Representative

Feedrail Corp., New York, manufacturer of industrial trolley busway electrification systems, appointed M. B. Squires Co., Pittsburgh, as its representative in that territory.

Alvey Conveyor Moves Branch

Alvey Conveyor Mfg. Co., St. Louis, moved its Boston district office to 750 Washington St., Dedham, Mass.

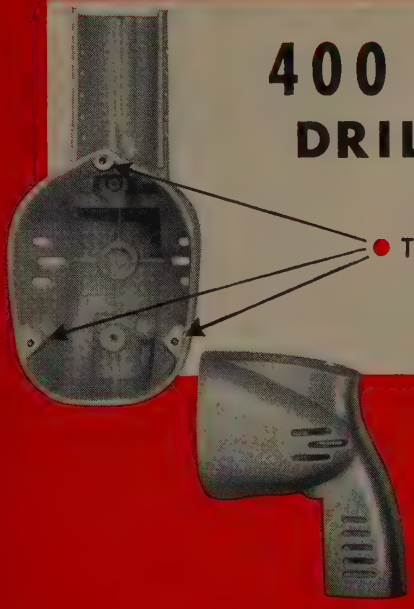
Atlas Powder Building Plants

Atlas Powder Co., Wilmington, Del., is constructing two esterification plants which will produce emulsifiers. One, costing more than $1 million, will be built in Memphis, Tenn.; the other, in Brantford, Ont., with the first unit to cost about $350,000. The firm's sales and research groups in the chemicals department have been realigned to form a special Food Industry Division which will be

AN A33A NATCO PROVIDES

High Production plus Flexibility

FOR THOSE SMALL PARTS



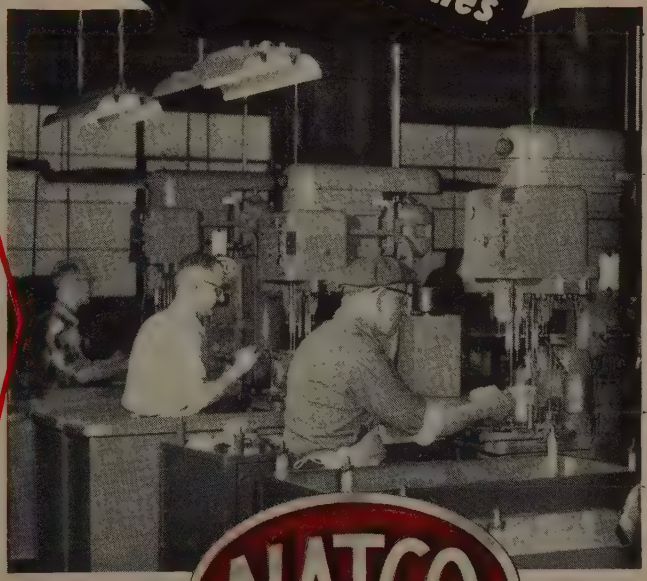
400 SMALL PARTS DRILLED or TAPPED PER HOUR

- THREE .1065 HOLES DRILLED OR TAPPED 6-32 TAP IN HAND DRILL HOUSING

JUST ONE OF MANY PARTS drilled and tapped on these NATCO High-Speed adjustable A33A machines

Another example of light sensitive machines

NATCO ENGINEERED for Quality and Quantity Production



ATCO DRILLING, BORING, FACING AND TAPPING MACHINES

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TIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Indiana
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FALO, 1807 Elmwood Ave. • NEW YORK, 35 Beechwood Ave., Mount Vernon

Call a Natco Field Engineer

under the general supervision of William W. Hays.

Bushwick Buys Steel Supply

Bushwick Iron & Steel Co., Brooklyn, N. Y., acquired the entire inventory of domestic steel from American Petrometal Corp., New York, which is retiring from the steel business.

Multi-Amp Corp. Moves

Multi-Amp Corp., manufacturer of portable high-current testing instruments, moved its entire facilities to larger quarters at 10 Third St., Newark, N. J.

Saco Lowell Retooling

Receipt of a government contract for 30 caliber machine guns which will keep the company's Edwards plant in Saco, Me., busy for another year following completion of a current order was announced by Saco Lowell Shops. The contract calls for $9 million worth of guns and $2 million for making tools with which to make the guns. After the contract is completed, the Army will purchase the tools.

Six months will be required to retool the plant. Production will then start on a limited basis with a gradual build-up to maximum monthly output by early next year.

Leary Mfg. Expanding

Leary Mfg. Co., Baltimore, steel fabrication and metal stampings, purchased about three acres on North Point boulevard, near Battle Grove road. Buildings on the site are to be remodeled, supplying about 4000 sq ft of space. New construction will add another 4000 sq ft.

Enters Nutmaking Field

American Engineering Co. reports through owners Max and Julius Polis that it is moving special-design machinery into a plant in Winsted, Conn., for precision nutmaking.

Metal Ski Firm To Build

Head Ski Co., manufacturer of patented metal type skis, will erect a plant, containing 7000 sq ft, at 1505 Roland Heights Ave., Baltimore.

Names Northwest Sales Agent

U. S. Pipe & Foundry Co., Birmingham, appointed Robert N. Park as its Pacific Northwest sale agent with headquarters in Seattl This terminates the arrangemer under which Hugh G. Purcell Co Seattle, had acted as Pacific Nortl west sales agent for the firm.

Forms Technical Society

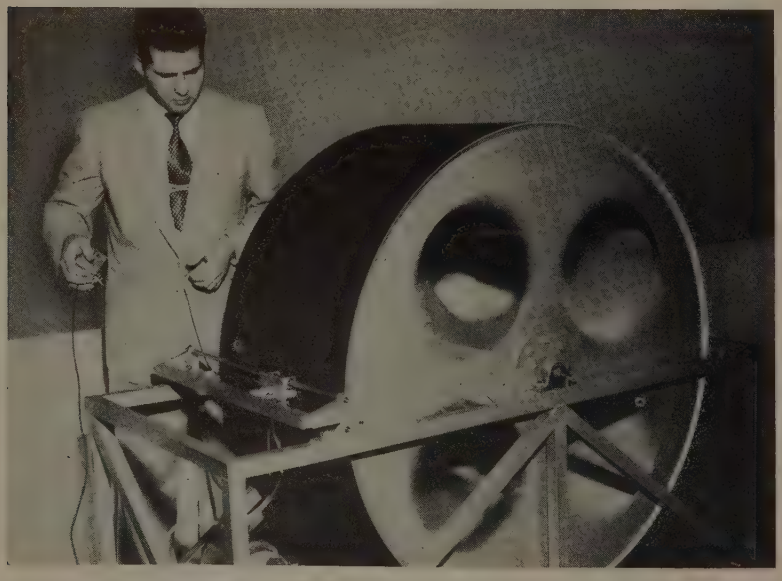
A new technical society, to b known as Hamilton Iron & Stee Branch of Canadian Institute o Mining & Metallurgy, has been or ganized in Hamilton, Ont., to serv the interests of the Canadian iro and steel industry. Its function will be similar to the American In stitute of Mining & Metallurgica Engineers, New York. Membershi is open to those actively engage and interested in the technical o production aspects of iron an steel in any of its production, fab rication or educational phase Committee members are R. I Hindson, chairman, Steel Co. o Canada Ltd.; F. J. McMulkin, vic chairman, Dominion Foundries Steel Co. Ltd.; and J. P. Orto secretary-treasurer, Steel Co. o Canada Ltd. Council members ar Dr. H. S. Armstrong, McMaste University; H. Thomasson, Cana dian Westinghouse Co. Ltd.; W R. Weir, Dominion Foundries Steel Co. Ltd.; T. H. Adair, At las Steels Ltd.; C. Makepiece Page Hersey Tubes Ltd.; R. C Stewart, John Bertram & Sons Co Ltd., and George Globe, B. Green ing Wire Co. Ltd.

Imperial Spring Moves Plant

Imperial Spring & Mattress Mfg Co., and its subsidiary, Alumi-Lit Products, are moving to their re cently completed premises on Mil ford avenue, Toronto, Ont.

Adamas Opens Enlarged Plant

Adamas Carbide Corp., to kee pace with the growing demand fo its tungsten carbide, has expand ed its operation for the third tim in 11 years, moving from Harri son, N. J., to its million-dolla plant at Kenilworth, N. J. Th plant will increase production ca pacity 50 per cent. In addition t tungsten carbide tools, tool tips dies and wear parts, the compan makes titanium carbide, tantalu carbide and columbium carbide.



Memory in Metal

This "air-floating" four-foot metal drum using an entirely new principle of computer memory has been developed by Logistics Research Inc. of Redondo Beach, Calif. The memory capacity of the new drum is 200 times greater than the conventional magnetic drum. An experimental model has worked perfectly

Announcing the POWRWORKER "26"

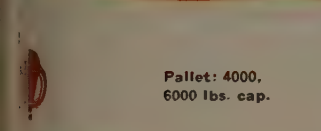
Feature by feature, it's engineered to meet your own handling requirements

Detailed job-studies in customer plants, warehouses and terminals dictated the features of the POWRWORKER "26". No truck on the market today can match the POWRWORKER'S combination of *user-benefits:*

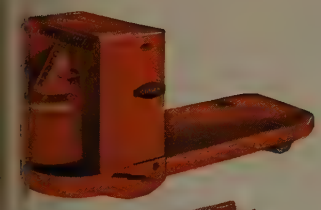
- **Maximum Maneuverability**—Only 26" longer than the load, the shortest standard truck on the market.
- **Light Weight**—Completely fabricated construction combines maximum strength with least weight.
- **Stability**—Close-to-the-floor, low center of gravity.
- **Great Efficiency**—Double reduction of spur gears gives maximum ton-miles at least power cost.
- **Balanced Load Distribution**—Double lift cylinders for smooth lifting and lowering.
- **Safety**—Deadman switch cuts power when brake is applied, handle automatically returns to brake-position.
- **Easy to Service**—All operating units accessible without lifting or dismantling. Drive wheel tire is quickly demountable.

We invite you to compare the 1954 POWRWORKER with any truck on the market! For details, call your local Clark dealer, listed in the Yellow Pages. Or send the coupon for literature.

Ask your Clark dealer about Clark's low-cost Pay-As-You-Go leasing plan.



Pallet: 4000, 6000 lbs. cap.



Platform: 4000, 6000 lbs. cap.

Stacker: 1500, 2000, 2500, 3000 lbs. cap.

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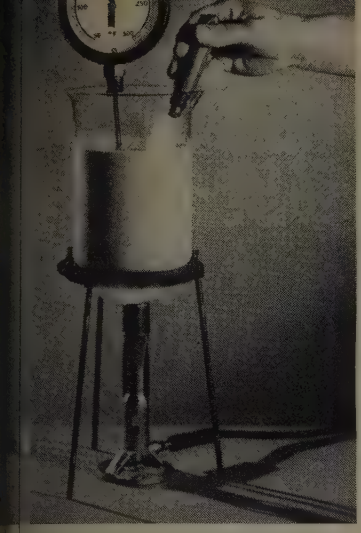
CUTTING. New S.E.C.O. keeps parts and tools cooler. Tools last longer, require fewer grindings; production is increased; finishes are uniformly good.

Now Better Than Ever!

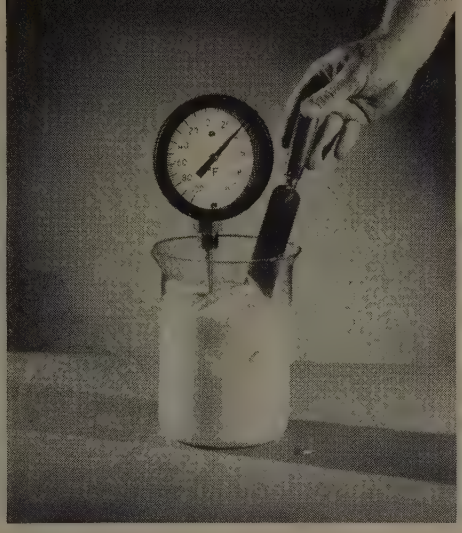
Sunoco Emulsifying Cutting Oil

New refining facilities improve industry's most widely used cutting oil and permit it to give these added benefits

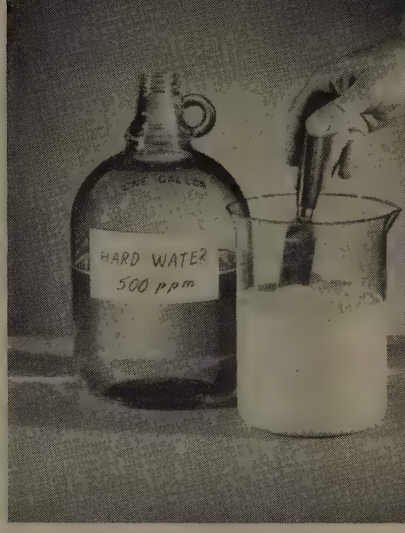
- **HIGHER MACHINING EFFICIENCY**—better finishes, longer tool life, increased production in cutting operations
- **INCREASED DETERGENCY**—particularly important in grinding operations—provides better surface finishes, prevents loading and glazing of the wheel, prolongs wheel life
- **BETTER MIXING QUALITIES**—in hot, cold or hard water
- **A PURER, CLEANER CUTTING OIL**—whiter, more stable emulsions; cleaner parts and machines; better operator acceptance
- **EASIER HANDLING**—pumps from storage tanks more readily, flows from drums faster
- **GREATER VERSATILITY**—can be used for rolling, washing and rustproofing as well as cutting and grinding



S BETTER IN HOT WATER. New S. C.O. mixes and remains stable v at 180 F. This permits its use n ashing and rustproofing.

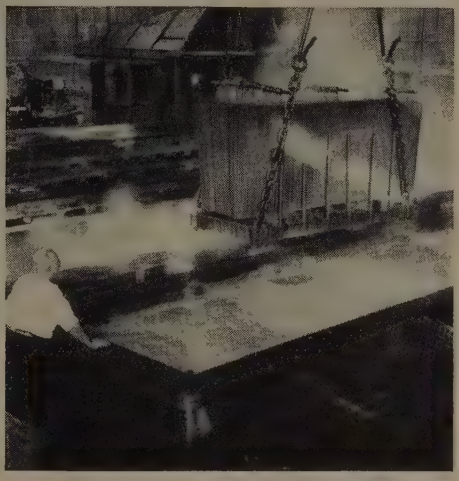


MIXES EASILY IN COLD WATER. New S.E.C.O. forms stable emulsions in the coldest water . . . even ice water does not affect it.



MIXES READILY IN HARD WATER. New S.E.C.O. eliminates the need for special hard-water grades of emulsifying cutting oil.

GI DING. New S.E.C.O. improves su ace finishes because its increased de rgency prevents loading and gl ing of grinding wheels, pro- lo gs wheel life.



RUSTPROOFING. New S.E.C.O. is a better hot rustproofing medium. It forms stable emulsions, coats metal parts uniformly, protects them against rusting.

WASHING. Because of its increased detergency and its ability to mix and remain stable in hot water, New S.E.C.O. is better for removing grease and dirt from metals.

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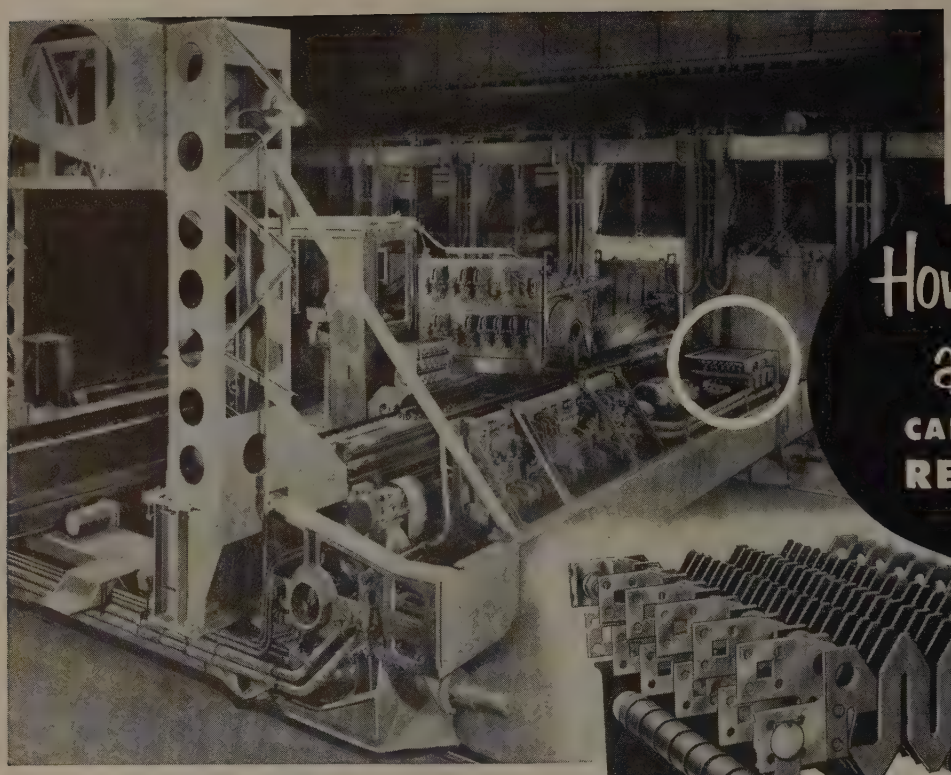
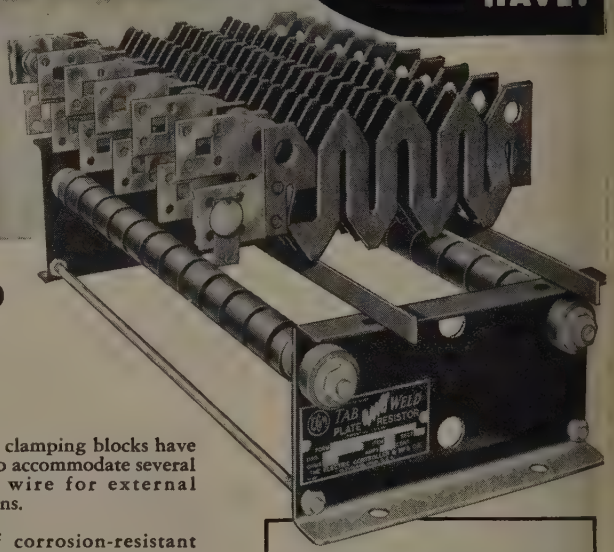


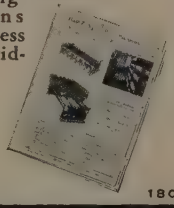
How many advantages CAN A RESISTOR HAVE!



ONLY EC&M TAB-WELD PLATE RESISTORS HAVE ALL THESE FEATURES!

1. Spot-welding of resistor ends, offset to bring adjacent grid eyes into intimate contact, results in permanent current-carrying path throughout the section.
2. No burning at grid eyes.
3. No periodic tightening of clamping nuts.
4. Terminal plates welded to resistor tabs along one side of section. Small adjustments in resistance value easily effected because plates are closely spaced.
5. No burning at taps.
6. Negligible resistance change between cold and maximum working temperature.
7. Insulating spacers of high dielectric strength accurately molded to shape from noncarbonizing material which remains dimensionally stable.
8. Terminal clamping blocks have grooves to accommodate several sizes of wire for external connections.
9. Made of corrosion-resistant chromium alloy steel.
10. Nonbreakable.
11. Double insulation to ground.
12. All standard sections same length, width and height.
13. Standard mill sections built with same size resistors per section.
14. Separate nuts on supporting rods clamp grid-stack independently of end-frame clamping. Accurate mounting-hole dimensions maintained regardless of variation of grid-stack length.

SHUTDOWN AVOIDED! Recently in one installation, a swinging overhead-crane load bumped resistors on charging machine and smashed end-frames and broke several spacers of grid assembly. *Shutdown was avoided* because current-carrying path of EC&M TAB-WELD Resistors remained intact and permitted charging of furnaces to continue. Later when down-time was available, section was replaced and returned to repair shop for new spacers and end-frames. This is another example of the durability of EC&M TAB-WELD Resistors.



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1806

THE ELECTRIC CONTROLLER & MFG. CO.

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Technical Outlook

INTERELATIONSHIP—Nitrogen is effective in preventing graphitization of iron. Aluminum promotes graphitization. Dr. G. V. Smith, U.S. Steel research laboratory, told ASM midwinter meeting in Boston last week: Accelerating effect of aluminum is probably due in a large part to the fact that it acts as a scavenger for the inhibitor, nitrogen. Steels investigated were in the commercial range.

BEST STANDS TEST—Trend toward specifying heats on a hardenability basis emphasizes the importance of obtaining laboratory-to-laboratory reproducibility on measurement of hardenability. As a result of an investigation carried out by Timken Roller Bearing Co., John Birtalan, told the ASM midwinter meeting in Boston that while adherence to certain procedures is necessary and certain precautions must be observed, the end-quench test has excellent reproducibility. Difficulties in use of the end-quench test appear to be the result of inadequent standardization of test technique, rather than any lack of thermal reproducibility inherent to the test itself.

SMALL GIANT—Under development is a gas turbine engine for helicopters that is about the size of the power plant in your car but six to eight times more powerful. General Electric engineers say it can be adapted as a power plant for fixed-wing aircraft as a turbo prop or turbo jet.

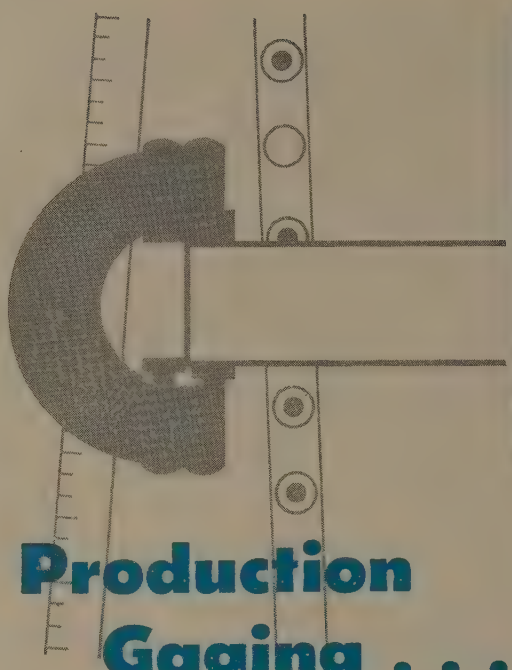
PICTURE TAKING—A new, high-speed, professional sheet film is said to have twice the speed of other films of this type. It is expected to be of particular help to industrial photographers with lighting troubles. Eastman states its Kodak Royal Pan boasts increased emulsion speed without an increase in film graininess.

STEEL PRESERVER—A rust preventative fluid that's said to be as easy to remove as it is to apply, prevents corrosion at least four days in salt spray tests. If preserver dries 24 hours, exposure time may be doubled. Oakite Products Inc., the producer, advises brushing or spraying for large work and tank immersion for small pieces.

TITANIUM HEADING—Chemically pure titanium wire can be used for cold heading if material is properly annealed with a good coat of copper plate. With upsetting diameters larger than 5/16 inch, heads may tend to crack if wire is not properly prepared. Only solution is to use heat at 1650° F, says Reed & Prince Mfg. Co., Worcester, Mass.

DUCTILE BERYLLIUM—To get ductile beryllium, grain size and grain orientation must be controlled, researchers at M.I.T.'s metallurgy department have found. During manufacture of practical shapes by mechanical working, such as extrusion or rolling, each beryllium crystal in the polycrystalline mass is deformed, stretched out and rotated. One of the ductile directions is lined up with the working direction. This makes beryllium, long noted for its brittleness, ductile in at least one direction.

SORTING—A portable, nondestructive metal sorter that does the job of chemical, spectrographic, magnetic or spark tests, has been announced by General Motors research laboratories. Operator merely touches the instrument's probe to a metal part to get an instant reading on a dial that compares the part's composition with the composition of another part. Device uses the thermocouple principle. Part being checked forms part of the circuit.



Between 500 and 700 threaded inserts are checked per ho on this air-electric gage. Measurements are taken b air. Lights on panel tell operator how piece measures o

Production Gaging . . .

INDUSTRY WATCHES ITS WASTE LIN

As management attempts to slash out-of-tolerance production, gaging manufacturers continue to stress importance of moving more gages onto the production line

By ROBERT F. HUBER
Machine Tool Editor

WHENEVER gaging specialists meet these days, conversation settles down to the problems and answers of tying gages in with the production line. Actual nature of these ties varies from the case of the completely automatic machine line to the fixed gage on the bench behind the lathe operator.

Even with all the differences in gaging applications, there's virtually universal agreement on one point. Gages, good ones, belong on the production line, as well as in the inspection department.

Closed in Time—Big reason for putting gaging devices right on the firing line is to prevent excessive out-of-tolerance production—the proverbial stitch in time.

Leaving all the dimensions checking for some final inspection department can be like closing the barn door too late to save the horse. By the time a tote box of bad parts reaches the inspection department, hundreds of dollars in rejects can have passed the faulty operation and be on their way through inspection to the scrap heap or the salvage department.

Here, Too—Automatic processing of the workpiece, automation, has made its inroad in gaging as it has in many other fields. Automation gages—usually air, electric or electronic—are being built and used both as components in large automatic production lines and as automation units themselves.

Gages tied in with an automation line usually check the controlled dimensions and accept or reject the part. When the part is rejected, the gage can automatically isolate it by marking or by setting it off the line.

Another Step—Not satisfied with letting their products check and rate parts, gagemakers have tied their gaging equipment in with the production process, thereby creating a closed-circuit type of machine control.

When the gage detects a part that is out of tolerance on a particular dimension, it sends a signal back to the tool responsible for that dimension and adjusts the tool so as to correct the off-limits performance.

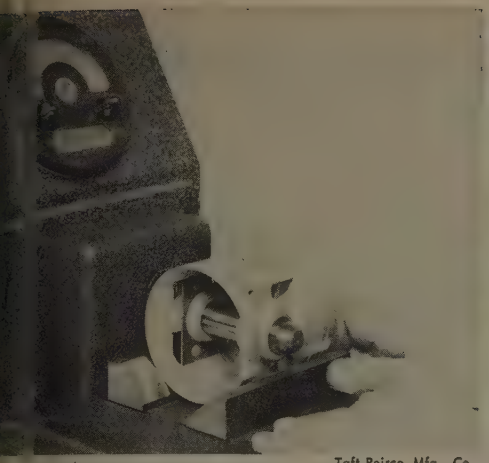
This feature, now used on some large automation lines has been widely applied as automatic size control on cylindrical and surface grinders, milling machines and screw machines. In the case of those machines using fixed tools such as the screw machines, gage will stop the machine when defective operation is detected.

Production gages generally are broken down into six categories: Air, electric-electronic, optical, mechanical, fixed, and penetration.

AIR

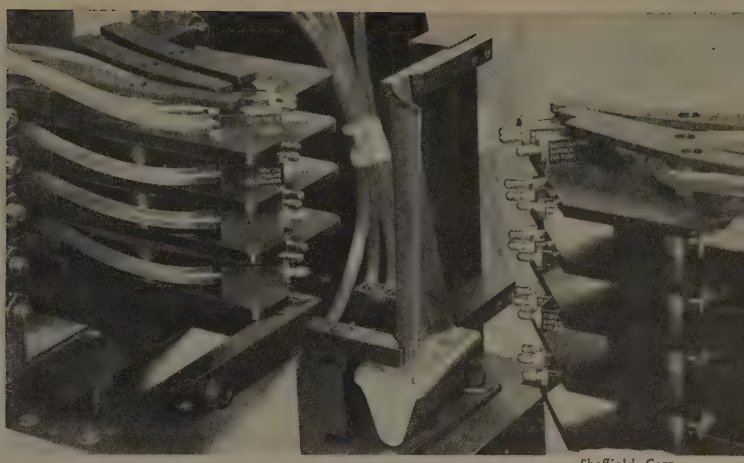
Air gages are essentially devices in which a controlled flow of air is passed through one or more orifices in the gaging fixture. Amount of restriction of the air flow at the orifice is a measure of fit between fixture and part and thus a measure of part size.

Growth—Because of their high accuracy and simplicity of construction, air gages are becoming an increasingly more important part of the gaging field. They i



Taft-Peirce Mfg. Co.

mputing air gage balances one air circuit against other to read squareness of piston pin hole to the rt. Operator reads his answer direct—no figuring



Sheffield Corp.

Thirty air cartridges gage contour of jet engine blade. Contact type air devices have overcome objection to air gaging for porous materials and narrow surfaces

rporate a minimum number of oving parts, require little or no aintenance, are self-cleaning and gged.

Air gages are well adapted for ulti-dimension reading and most them can be connected into an r-electric, or air-electronic cir- it for machine control. They are sy to use, the basic units can be plied to a multitude of fixtures r different measuring jobs and ey are capable of high amplifica- n, up to 100,000 to 1 if needed, r close tolerance reading.

No Mars—Lack of contact with e workpiece makes air gaging eal for checking parts that must have a high, unmarred finish, or for fragile parts.

Victory — Contact-type gages make it possible to check porous materials and narrow shoulders. Here, the air flow is restricted not by the workpiece but by what amounts to a valve which is depressed on contact with the workpiece. Flow varies with the distance which the valve is depressed.

Another set of jobs which air gaging has whipped is that involving taper, twist, squareness, etc. By matching two or more air circuits, these readings can be taken simply. In the case of Taft-Peirce computing gage, the readings can be made direct on one dial.

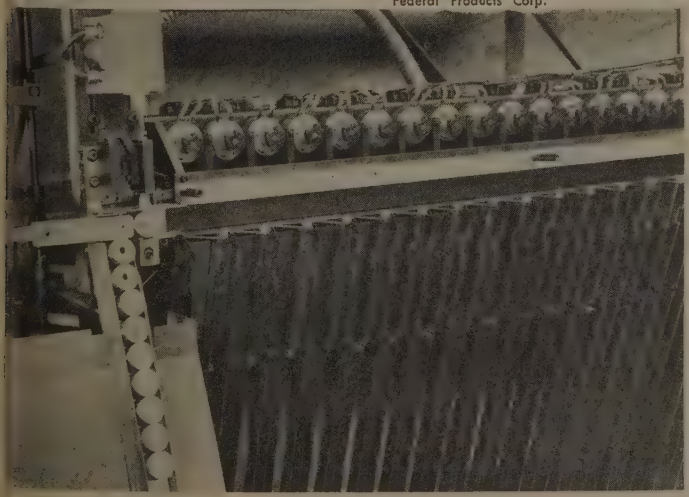
Do It Yourself—Another trend in air gaging, which can be traced to its simplicity, is the manufacture and sale of gage cartridges which the user can mount in his own fixture. W. I. Wilt, Sheffield Corp., predicts it will lead to much wider use of multiple-dimension gaging due to the lower initial cost of the gage equipment.

In these cases, setup and rough gage adjustment are made on the fixture. Final precision adjustment is made at the gage through a bypass valve which locates the needle or float on the scale.

(Continued on p. 100)

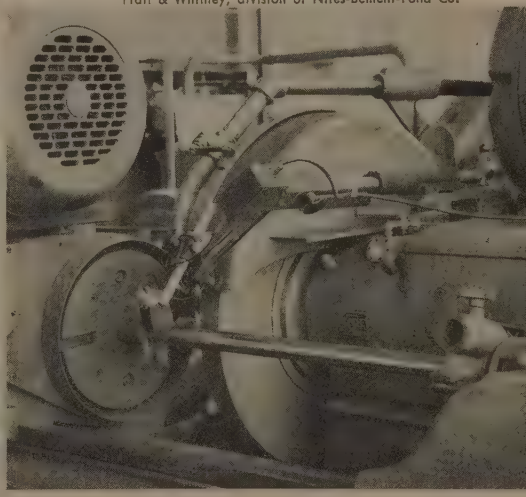
ectronic sorting machine checks diameter of refriger- or pistons. Pistons are then shoved onto conveyor d moved to left. Chute door corresponding to OD e opens and piston falls into proper chute

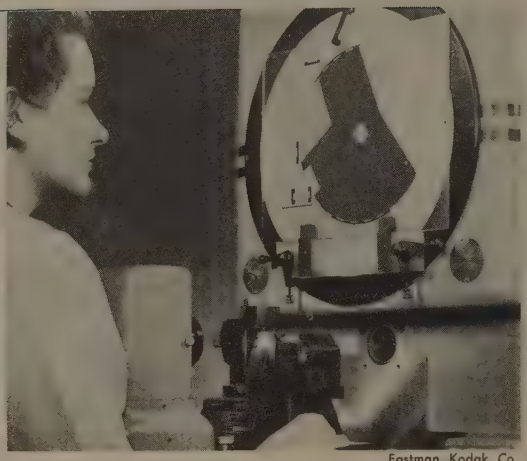
Federal Products Corp.



Gage point on roll grinder traces contour of the roll and duplicates it on a chart. This is an example of trend toward putting gages on machine tools. While some simply indicate, others actually control the machine

Pratt & Whitney, division of Niles-Bement-Pond Co.





Eastman Kodak Co.

Optical comparators project image of part on screen to compare it with acceptable shapes. The systems are particularly valuable for intricate contours

Fixture used by Torrington Mfg. Co., Torrington, Conn., checks rotational symmetry of blower wheels in two planes. Two dial indicators show runout

ELECTRIC-ELECTRONIC

This group of gages is leading the way toward automatic sorting and classifying. Simplest of these devices is the electrical contact type which generally incorporates a spindle like that of a dial indicator.

Changes in the size of the work move the spindle and actuate switches. Operation of the switches, one is usually for the high limit and one for the low limit, sets up electrical circuits to light lights, sound warnings, or control disposal traps and auxiliary equipment.

This type has several advantages. It is the least expensive basic measuring device available commercially which will set up an electrical impulse. Also, the repeat characteristics are excellent.

Error—Main disadvantage of the unit is that it is possible to have bounce at the electrical limits if the spindle is moved too rapidly, and this may cause some inaccuracy at one of the limits. In general, R. A. Souler, Federal Products Corp., Providence, points out this type unit should be used for jobs where less than 100 parts per minute have to be checked.

Electronic gaging comes into its own in multiple-classification sorting. Here a spindle is depressed as the part moves through. The spindle carries either a magnet or coil. Where no more than 60 to 70 pieces per hour are to be checked, the magnet, which is moved between two 60-cycle coils, can be used. For higher rates the spindle usually carries a coil which is moved relative to two fixed coils on the gage body. These coils carry current at 100,000 cycles or more per second.

How It Goes—The induced current is amplified and then fed into a classifier. This unit consists basically of a series of thyratrons, one for each size category. As the gage signal voltage rises in accordance with the size of the part, one thyratron after another fires. The last unit to fire operates its relay and trap door, and the gaged part is dropped into its proper size slot. The illustrated piston sorter is of this type. It classifies 2400 pistons per hour.

With respect to automatic gaging and sorting, on many jobs where fit between mating parts is actually more important than size, automatic sorting can speed up assembly by eliminating trial and error, and can sometimes permit opening up of machining tolerances which may have been tough to hold.

OPTICAL

Optical gaging also is moving from the tool room to the production line. One reason for this is the increasing versatility of the method, which leads towards optical inspection applications not previously considered possible.

Usual concept of optical inspection involves the projecting of a black image to a glass screen for inspection of irregular outlines and other shapes such as radii, thread forms, form tools and the like. This is old fashioned only in the sense that it's too restricted. Inspection like that pictured here will continue to constitute a large and challenging part of the optical applications.

Wider Scope—New developments in optical gaging methods, however, are broadening the horizon. Robert Hudak, special products sales division, Eastman Kodak Co., Rochester, N. Y., says of one of the refinements, "Perhaps the first change in the concept of what optical inspection can do has concerned the size of parts which can be regularly considered as suitable for screen viewing.

"Industry now considers it not unusual to inspect parts several feet long, even though the maximum field of view of the optical system may be only 1.4 inches in diameter. This is done through fixed stops or indexing, thus successively positioning various sections of each part in the optical beam. Utilizing the same techniques, there are few theoretical limits to the size parts which might be inspected by the screens."

FIXED AND MECHANICAL

Old Faithful—Plug, ring, snap and other fixed gages have for years been the standard gages for

alworking production. While
trend toward automation has
much of the limelight recent-
t must be remembered that in
ıy metalworking plants, these
es are still best for the job.
undamentals of the gages are
hanged. There has been a large
wth in the use of carbide for
eased wear and abrasion re-
ance.

tandardized—In its line of dial
.cators, L. S. Starrett Co., Athol,
ss., will soon announce a new
es which features simplified
t construction with fewer parts
greater accuracy and longer
. One of the big advantages to
s series is that parts are stand-
ized so the user who stocks re-
r parts can simplify his inven-
y. Line also features satin
ome finish, rustproof stainless
rs, pinions, racks and spindles,
heavier bridge and case.

Dial indicators are now widely
d on production lines for multi-
ension checking. They're simply
unted in a fixture and set to a
ster.

n its Intramike, Brown &
arpe Mfg. Co., Providence, has
plified the measuring of some
ernal diameters. Device is as
y to operate as any OD mike,
ds the same and has the same
erent accuracy. As the barrel
adjusted, a scroll-cone advances
withdraws three spindles.

PENETRATION

These gages are used for meas-
ement where contact can't be
de with the material, as in hot
ip mills. Gages use x-rays, beta
rticles or some similar radiation.
It consists of an emission source
one side of the material and a
eiver on the other. Readings can
taken direct or can be fed back
the rolls or machine for dimen-
n control. They're already ac-
oted by most users.

Summing up the trend in all
ging applications, V. L. Howe,
att & Whitney, division of Niles-
ment - Pond, West Hartford,
nn., says his company feels,
hat a much closer integration
tween machines and gages will
a natural evolution in the near
ture—that we stand on the
reshold of an 'in-process' gaging
a with gages built into machines
standard components."

At left, prepoured concrete jig base is lifted into position on factory floor. Then steel jigs are placed, at right, on the concrete-base steps

Assembly's Firm Base

Movement in assembly jigs is not a new problem, but here's one new and permanent answer. Secret is to set jig members on firm foundations—these are based on concrete

ONE OF THE latest, and potentially one of the biggest strides in aircraft jig development was disclosed recently in the form of concrete nonadjustable jig parts.

Men who are watching it prove itself predict that the combination of concrete and steel is likely to be the jig of the future.

Tested—Jig system has been in use for several months at Boeing Airplane Co., Seattle. Here's how it works.

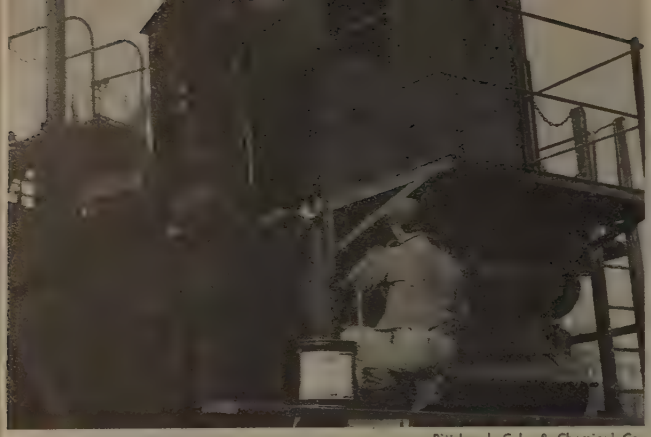
Large concrete bases, weighing up to 10 tons, are precast out in the yard. When concrete sets, the base is moved inside the plant and the jig is erected. Jig itself—the critical tool part on which the B-52 stabilizer is put together—is steel. Only the members which support it are of concrete.

Steps—Besides a central concrete tower there are 12 smaller piers which are stepped up in size at the same angle as the trailing edge of the B-52 stabilizer.

Although the contractor had no experience with jig building, he constructed the concrete supports with more accuracy, at one-third the cost, and in one-fourth the time it would have taken to build a comparable steel base.

Advantages—From the housekeeping standpoint, there are no nooks and crannies for dirt-catching.

Jig is assembled faser than one of all steel. Base is more rigid than steel base, and it has a dampening effect on vibrations. Also, there is no shrinking or expanding with temperature change.



Pittsburgh Coke & Chemical Co.

Heavy-duty, tar-base coating is being applied to the locomotive unit of a quenching car used in coke oven operation. Coating offers resistance to moisture, most mineral acids, alkalies, vapors and general weathering

Insul-mastic Corp. of Ame

Huge pipe and its tubular supports are subjected chemical fumes and vapors from coke quenching s tions. But a heavy, reinforced asphaltic coating giv needed protection without usual coating maintenan

Modern Coatings

ADD SERVICE LIFE

In maintenance of buildings and structures, synthetic-binder paints and mastics offer top performance under most adverse corrosive conditions. Here are some practical tips

Today, March 15, marks the opening of the 10th annual conference and exhibition of the National Association of Corrosion Engineers at Kansas City, Mo. Program includes symposiums on such subjects as corrosion principles, nondestructive testing, costs of corrosion and pipe line coatings.

YOU can count on modern protective coatings as sturdy barriers against corrosion in the general maintenance of buildings and structures. Although they may cost more than ordinary, oil-base paints, they stand up much better in the presence of heat, constant exposure to weather or chemical attack.

Of course, the mere purchase of synthetic-binder paints or mastics (both classed as modern protective coatings) does not guarantee top performance. It's generally agreed that good protection hinges on three things: Proper coating selection, proper surface preparation and proper application.

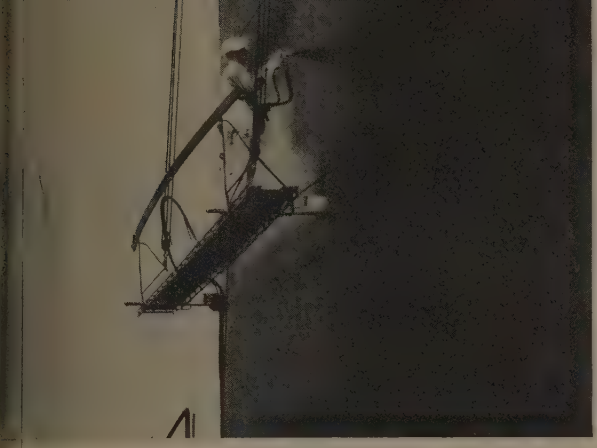
Selection—When a corrosion engineer puts his stamp of approval on a coating for a particular jo he usually thinks in terms of a hesion, permeability and the abili of the coating to withstand e vironmental attacks. Likely as n his choice is a compromise.

In general, barrier-type coatin have low permeability and good r sistance to environment. But the adhesion is on the fair side. G

Interior of this brine storage tank is coated with a vinyl-base material. Service results show that these coatings have protected tanks against corrosion from brine for as long as 8 years. Material is colorless

Interior and exterior of this steel water plant pi were protected with a spray-applied coating of bi mastic primer, followed by a hot coating of bitumas enamel. Enamel was produced from coal-tar pitch ba

Koppers Co. I



United Chromium Inc

ecial coating filled with granulated insulating rk was used here to prevent heat loss. After care- surface preparation, the ¼-inch-thick barrier s applied in one coat. Mastic coats may be thinner

Vinyl or chlorinated, rubber-base protective coatings are used here to protect plating equipment against acids, alkalies, water and many plating chemicals. A trend is to use plastisols with this type equipment

é other hand, permeability isn't ch a big consideration with coat- gs that retard galvanic action he other basic type). Resistance environment is their shortcom- g. Their adhesion is good.

Rule of thumb: Coating selection ould be based on type and sev- ity of exposure. For example, a rge steel plant first protected its ld blast main with red lead and rbon black. In this general steel ant atmosphere, the coating eeled in six months. Management en tried a mastic-type (one coat ver a primer). At the end of one ear, it was still in good shape.

Surface Preparation — To get a rface that insures good adhesion, nd blasting is the preferred pre- aration method. If this is not possible, correct metal priming coatings with good wetability, penetrability and corrosion-inhibitive properties are a likely second choice.

It is always wise to remove mill scale from new steel; and, to prevent recontamination after cleaning, painting should follow as soon as possible.

Compared to thinner coatings, surface preparation for the application of mastics may be less important—organic barriers normally do not exceed 10 mils in thickness, while mastics may run from 10 mils to 1/16 inch. Even with mastics, care should be taken to remove all loose surface materials, moisture, oil and other foreign matter.

Application—This is the critical item. The general rule—use at least three coats—is dictated by two things: The porosity of most coatings and the fact that the film draws thin over sharp edges and prominences.

Discontinuities in any one of a series of coats will not usually coincide with those in the preceding coats; thus, the number of accidental discontinuities that remain in a finished coating will be decreased with each succeeding coat.

It is generally agreed that the best way to assure good coverage over sharp edges and corners is to apply multiple coats or passes to a dry film thickness of at least three times the profile depth of the surface roughness. In most cases, the combination of the two considerations will call for a minimum film thickness of from 5 to 6 mils, but it should be noted that surface prominences actually control thickness.

Generally speaking, the three-coat rule also applies to mastics to avoid pinholes, capillaries or exposed metal. One exception is the fibrated, mastic-type of coating that has shown good results in severe industrial atmospheric exposure. This is probably due to good coverage over rough areas, corners and the absence of porosity. Coatings are sprayed on to about ⅛ inch thickness and tested for pinholes with spark testers.

Mastics of bituminous base also have been used to get heat insulation and corrosion resistance.

bd lead and carbon black coating on this cold blast ain peeled in six months. Bitumastic coating now sed has a serviceable temperature range of —50 to 200°F. It was still in good shape after first year

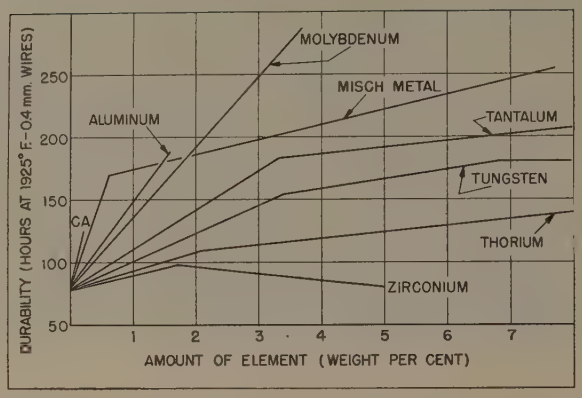


Fig. 1

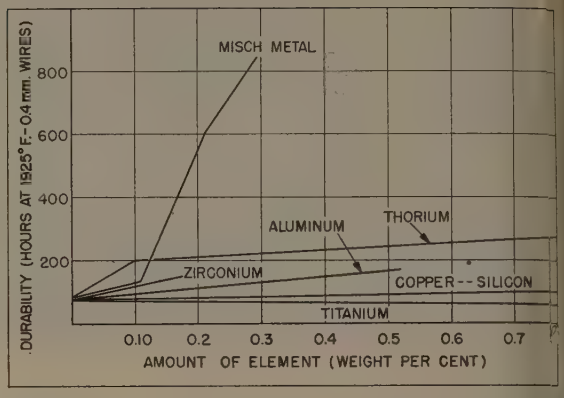


Fig. 2

Rare Earths Moving Fast

Valuable properties result from addition of small quantities of rare earths to conventional alloys. Research and plant tests now going on will expand applications in many fields

By WILLIAM E. KNAPP
and
WILBUR T. BOLKCOM
American Metallurgical Products Co.
Pittsburgh

SOMETHING LIKE a metallurgical maelstrom is whirling around the rare earths these days.

Oddly enough, the closely-knit family of rare earth elements (lanthanum, cerium, praesodymium, etc.) hibernated for many years as a curio. Although consisting of 16.3 per cent of the old-fashioned periodic table of 92, and more abundant than lead or tin, their only application was flints for lighters.

Start—Not until 1938 when W. Hessenbruch, a German professor, reported that these elements imparted a remarkable increase in life of resistance wire in a variety of alloys did interest perk up (Figures 1 and 2).

Commercial producers of this wire began using misch metal, a mixture of rare earth metals having all 15 of the elements. Lohr claimed a 250 to 300 per cent life increase as measured by ASTM test B 76-39 (U.S. patent 2,581,420 assigned to Driver Harris Co.).

Since heat resistant wires are highly alloyed, rolling and drawing to wire size are problems. It soon became apparent that the rare earth metals imparted hot workability to such an extent that some alloys formerly considered almost impractical could be rolled as easily as AISI 1040.

More Benefits—Also, at about this time, several other important rare earth benefits were established: 1. Resistance to oxidation and scaling is increased from three to six fold in a variety of alloys, ferritic and austenitic, and even in some containing no iron. 2. Hot ductility (over 2000° F) is greatly improved. 3. Pressure required to hot work alloys is lowered 25 to 60 per cent.

Next surge of interest centered around processing benefits impaired by rare earth additions rather than end product improvement. Today, because of superior workability, almost all producers use rare earths in such grades as 30, 310, 330, etc.

Certain grades, never before known in wrought form, are being fabricated in wire, sheet and tubing with help of rare earth. One of these grades contains about 25 per cent nickel and 20 per cent chromium.

Less Nickel—Another discovery sparked more interest: Chance observation revealed that the long accepted chromium-nickel ratios required for commercial rolling of stainless no longer existed when rare earth metals were properly introduced. A shop can roll such grades as type 304 stainless using 1 per cent less nickel if 1 pound per ton of the rare earth metal mixture "Lan Cer Amp No. 10" is added. This substitution gives sizeable cost savings and conserves alloys.

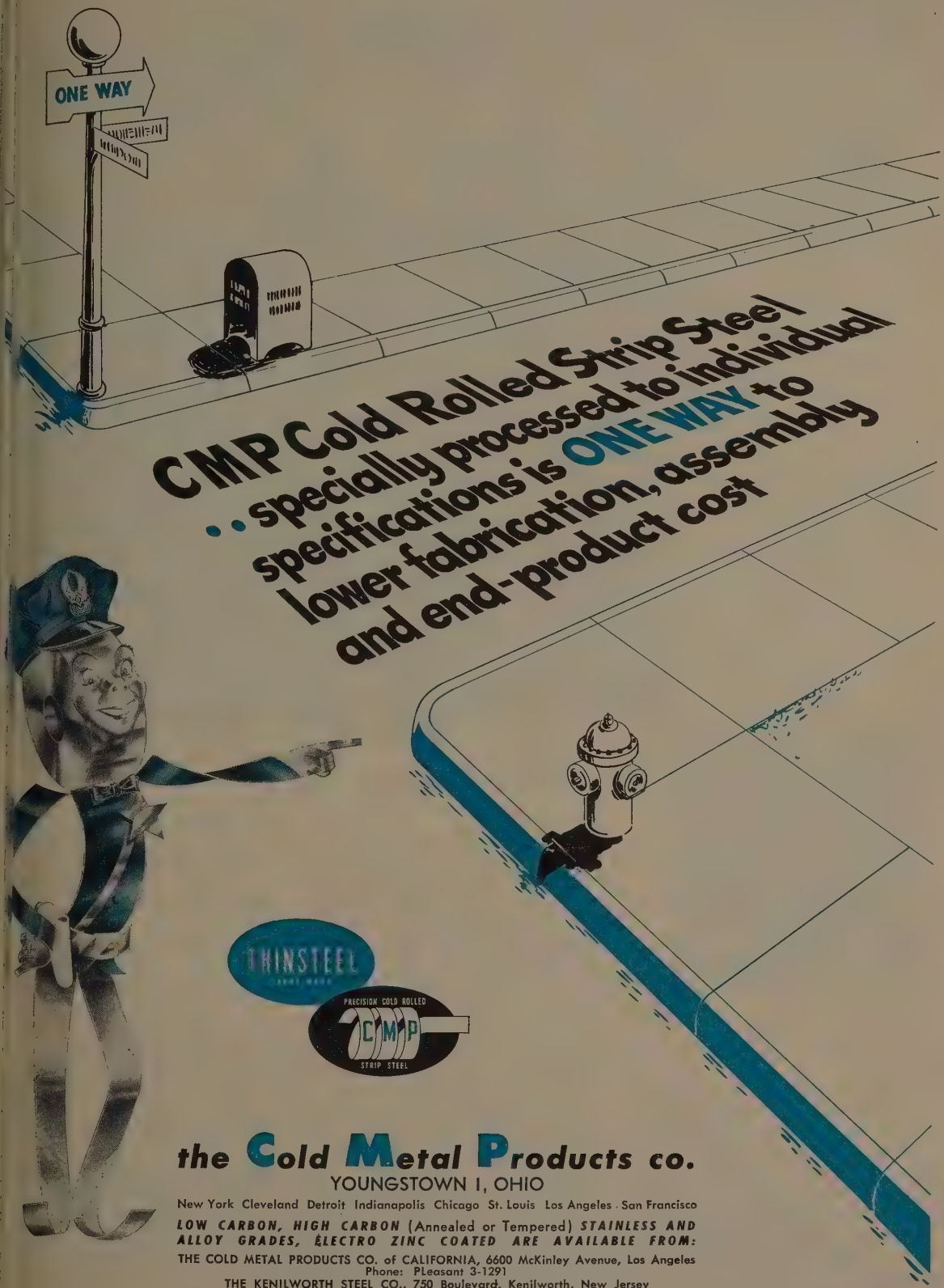
Even more commonplace steels fine grained AISI type 1020 for example, can use rare earths to im

TABLE I

Hot Twist Results on A 0.23 Carbon, 2.10 Manganese Steel with and without Rare Earth Metal Addition

TEMPERATURE	TWISTS TO DESTRUCTION	
	Rare Earth Treated*	Untreated
2000° F.	460	160
2100° F.	855	250
2200° F.	760	340
2300° F.	670	390

*Addition: 2 pounds/ton "Lan Cer Amp"



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RARE EARTH FORECAST

Here Are Predictions on Their Alloy Possibilities

1. Better hot workability and ductility will make possible the use of wrought alloys having high creep strength.
2. Property of occluding hydrogen at elevated temperatures and fixing sulphur into stable, high melting compounds will give improved welding rods as a result of welding experiments now under way.
3. New concepts of impact resistance, ductility and hardness possible with engineering alloys will be taken into consideration by design engineers.
4. Specifying strategic alloys in short supply for ductility reasons for use at temperatures down to minus 150°F will be eliminated in ferritic grades.
5. Property of improving oxidation resistance of steels will be used to advantage in aircraft engines, gas, and high temperature steam turbines.
6. Entirely new alloy systems using rare earth elements in quantities up to 5 per cent may be developed.
7. Leaner alloys may come to the front with corrosion and stress rupture properties equivalent to high alloy compositions.
8. Commercially practical high temperature aluminum alloys with safe operating temperatures at 700-800°F may result from metallic rare earth additions.
9. Cost of using rare earths in steel will drop below $5 a ton. How? By decreasing quantity necessary to give desired results. (Development of "Lan Cer Amp No. 10" rare earth metal mixture cut the cost of treatment almost 50 per cent within the last year.)
10. Research in metallurgical physics will show that changes in crystal lattice resulting from small additions of rare earth elements probably accounts for the changes in fundamental properties of the alloys.

prove workability and still keep costs in line. Data in table I show how rare earths improved hot twist results on a 0.23 carbon, 2.10 manganese grade.

Helps Shock — Interest in rare earths picked up again when it was discovered that the elements in metallic form gave greatly increased shock resistance to engineering alloys as measured by impact tests.

Tests on hundreds of production and laboratory heats show that rare earth metal treated, quenched and tempered steels (cast or wrought) have from 35 to 150 per cent better impact properties from minus 100° F up to elevated temperatures. Ductility as measured by reduction of area is improved from 25 to 50 per cent. Elongation at elevated temperatures (over 1200° F) is improved from 100 to 300 per cent.

Case in Point—Here's one report on the effect of a rare earth metal addition ("Lan Cer Amp" was used) to cast steel: The treated steel gave the same V-notch charpy (at minus 40° F) impacts at 160,000 pounds per square inch and the same reduction of area at 190,000 pounds per square inch levels as the untreated metal at 120,000 pounds per square inch.

These uses stimulated activity on the exploration front, too. The result: Raw materials for rare earth applications are in abundance for many years to come. Combination of adequate supply and widespread research activities in industrial plants and laboratories are certain to lead to important new developments in this field.

From Atoms To Ions

NATURAL isotopes of the rare earth element, gadolinium, are being separated for the first time in a mass spectrograph, or calutron, by Oak Ridge National Laboratory. The calutron is an adaptation of equipment used during World War II for separating U-235 by the electromagnetic process. Oak Ridge is operated by Union Carbide & Carbon Corp. for the Atomic Energy Commission.

Isotopes of gadolinium are separated by heating gadolinium chloride to about 1500° F, decomposing the molecules and converting the gadolinium atoms to positive-charged ions by bombardment with electrons of a few hundred volts energy. Ions are accelerated by an electric field of about 35,000 v so as to propel them across a magnetic field, where they are constrained by the field to a circular path of travel.

Half-Way Around—The radii of travel of the isotopes are proportional to the isotope weight. After these isotope ions have gone half way around the circle they are captured in collectors placed at such positions to intercept the isotopes of different weights.

Gadolinium is of great interest in the field of nuclear physics because some of its isotopes have extremely high absorption cross sections for neutrons. Uses, for the most part, are undeveloped because it has not been available in large enough amounts for extensive study. The new method should make it available in larger quantities.

Rare Earth—Gadolinium is the fourth rare earth that has had its isotopes separated at Oak Ridge.

Three-Section Forger

A 10-inch horizontal forging machine is being installed by Turns, Louisville, Ky., for forging components for military and commercial aircraft of advanced design. The machine weighs 968,43 pounds. It was designed and built by National Machinery Co.

The frame was cast in three sections, to be joined by forged tie bars and rods that will become integral parts in the final assembly.

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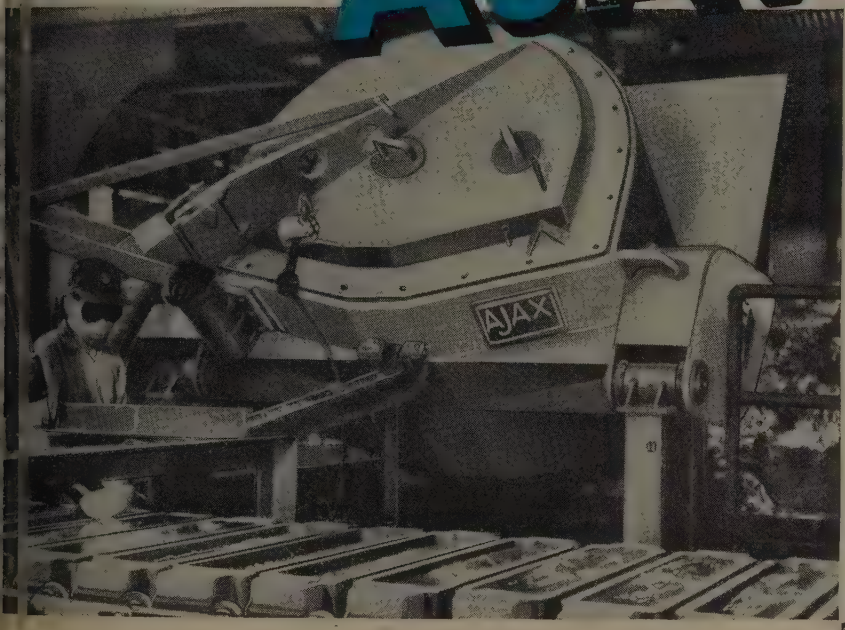
get the highest possible recovery of aluminum scrap with

the help of AJAX TAMA-WYATT Induction Furnaces—



AJAX induction furnaces are used in many plants for the efficient recovery of loose scrap, such as foil, chips, borings, turnings and the like. They are also adaptable for the full range of non-ferrous metals and alloys with the same advantages obtained in aluminum, and are built in sizes ranging from 20 kW to 1400 kW.

AJAX line frequency induction furnaces will melt aluminum foil scrap with the lowest obtainable melting losses. Photo above shows an AJAX 166 kW melting furnace installed at the plant of the Toyo Aluminum Works in Yao, near Osaka, Japan. Unbaled foil scrap shown at right edge of photo is remelted at the rate of about 900 pounds per hour with a recovery of over 99%. Molten metal is poured into ingot molds as shown in the front of the photo. Another view of same furnace is shown in small photo at right.

Send for Reprint of Article on Scrap Recovery by Induction Furnaces

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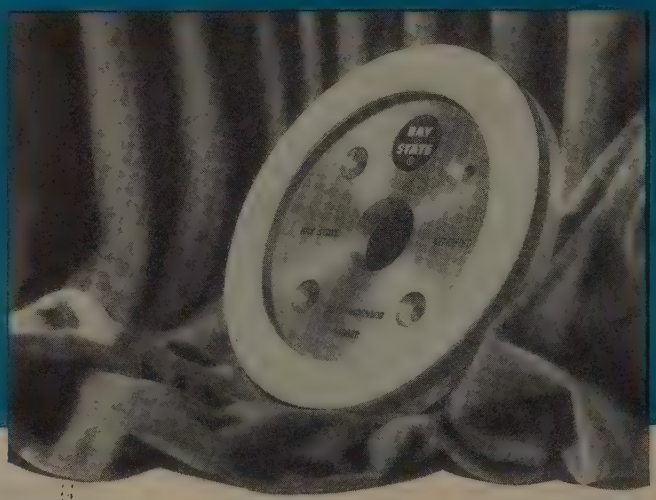
Bay State Diamond Wheels...



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v from the operator's side of the machine shows how balers are fed continuously from same main hopper

Main ram in the foreground compresses scrap into an 11-inch cake. The two rams at 90 degrees complete the bale

Speedy Balers Feature Uniformity

Twin units at Pontiac were designed and built in Germany. Different operating principle enables them to turn out compact, 11-inch cubes at a 5-ton-per-hour clip

SOMETHING new in scrap balers is hard at work at Pontiac Motor Division, General Motors Corp., even though the new stamping shop it will service is just being installed. The new machine is a product of the Lindemann shops in Dusseldorf, Germany, and is the first installation of its kind in the U. S.

The machine is actually composed of two baling units, each capable of five tons per hour. One operator runs both balers, although with a steady scrap supply the operation can be set to run automatically. Big advantages, however, are better weight control and more compact bales.

Different Principle — Where most American-made balers operate in a pit beneath floor level, the Lindemann unit works three and four feet above the floor. That way instead of compressing the bale and raising it up to floor level, the German machine ejects the 60-pound bale into a shallow pit where it is carried by conveyor to the car loading area.

In this type of operation, scrap must be carried to an elevated hopper which feeds the balers. This is done by an inclined conveyor belt that takes sheet scrap from a central gathering point and dumps it into one main hopper which feeds both baler hoppers.

Here's How—Each baler unit is composed of three rams, two smaller ones opposing each other and one large ram working at 90 degrees to the other two. All work off a 4500-psi hydraulic system that is an integral part of the original German design. Pumps and motors are located on floor level where they are easily accessible. Valve mechanisms and oil collecting tanks are located in the basement, out of the way.

At the beginning of the operating cycle, all rams are retracted leaving the baling chamber open to gravity flow of scrap. With the chamber filled, the large ram moves forward, compressing the metal into a cake 11 inches thick and the full width of the chamber.

As it moves forward, a knife blade designed into the top surface of the ram slices across the opening between chamber and feed hopper, making a complete cut for each bale.

With the cake compressed to 11-inches, the two opposed rams move in and press the cake into an 11-inch cube. Type of scrap, pressure used and distance of ram movement all combine to produce the 60-pound cubes that vary only slightly in weight when the machine is operating at its rated capacity.

New Car Loaders—Unlike most other scrap handling systems, the new one at Pontiac provides for loading of gondola cars on an indoor siding. The single track bay can hold four cars at a time, more than enough for a full 3-shift operation of the balers.

Loading the various cars is a simple matter. Bales move on a chain-driven apron conveyor which slides them up an incline to the loading level. Trap doors in the apron located at strategic carloading positions, can be opened at several points over each car and the bale merely drops through the desired opening. Cars can thus be loaded in almost any sequence.

These are the working with the to make your

AT LEBANON there are electric furnaces capable of melting up to 8500 pounds—induction furnaces with 2000-pound maximum capacities. Here, too, special Swiss* molding and production processes are combined with the finest in American methods and procedures. The CENTRI-DIE* process for making centrifugal castings in permanent molds—a process *introduced* in this country by Lebanon—provides the highest quality castings for difficult corrosion and heat resisting services. Pattern-making, core-making, heat-treating, finishing and cleaning complete the picture of equipment that produces Lebanon CIRCLE Ⓛ castings.

But equipment is not the whole story. Lebanon

CIRCLE L

CARBON, SPECIAL ALLOY AND STAINLESS STEEL CASTINGS

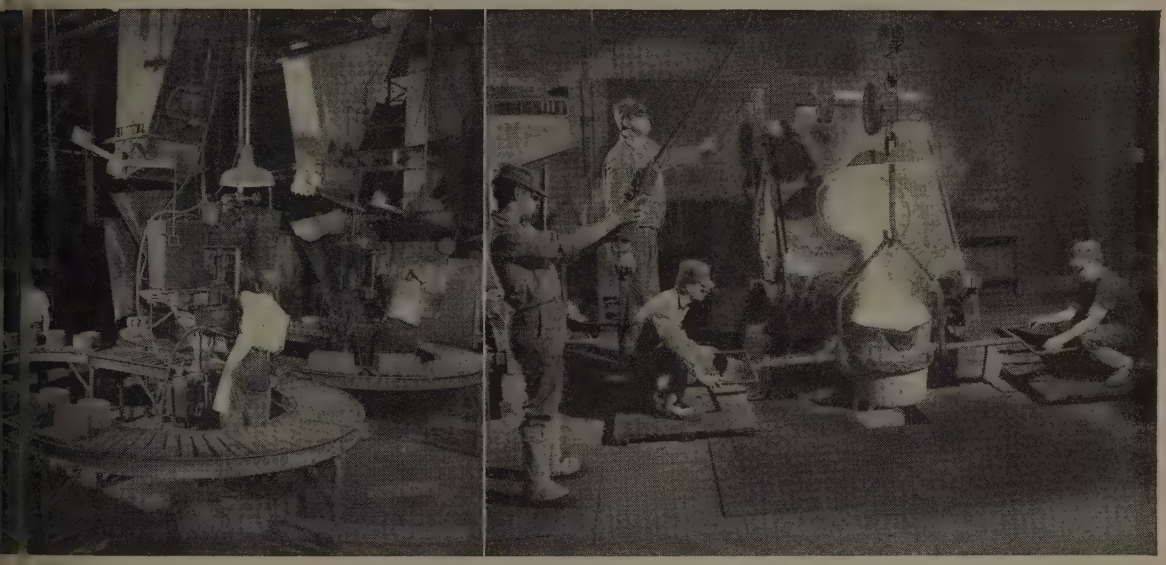
LEBANON STEEL FOUNDRY

LEBANON—PENNSYLVANIA

right men

right equipment

STEEL CASTINGS



oundrymen add immeasurably to the high quality f CIRCLE Ⓛ engineered products. These workers are raftsmen in every sense of the word, men trained nd highly skilled, men dedicated to doing all they an to make your castings *right.*

f the pictures on these pages could talk they'd ay, "Here's where equipment and craftsmen make Lebanon CIRCLE Ⓛ castings to a *high standard*—not to a price!" We believe sincerely that there is no economy in buying just by price . . . it is far better to buy the best product at a reasonable cost.

LEBANON STEEL FOUNDRY • LEBANON, PA.

*Special processes acquired from George Fischer, Ltd., of Switzerland. Lebanon Steel Foundry was also the original licensee for the centrifugal casting process developed by Firth-Vickers Stainless Steels, Ltd., Sheffield, England.

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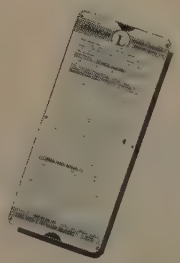
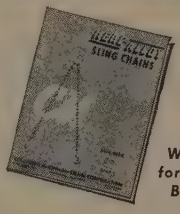
This handy slide chart gives you the nominal analyses, various designations, minimum mechanical properties and heat treatment for 19 Lebanon carbon and low alloy grades and 17 stainless and corrosion-resistant grades. Send coupon today . . .



SPECIFY

HERC-ALLOY

SLING CHAINS



Write for Data Book

HERC-ALLOY Sling Chains are made-up to order, are individually tested, registered and guaranteed.

Hundreds of plants like the one shown above* are using Herc-Alloy Sling Chains. Greater safety is their big reason for doing it. But there are other factors too. Herc-Alloy is economical because of its long service life. Then too, the use of alloy steel permits a weight reduction that helps prevent worker fatigue. These advantages are worth thinking about. Those who do consider them seriously generally adopt safe Herc-Alloy Sling Chains for their plants.

*LAKE ERIE ENGINEERING CORPORATION — MANUFACTURER OF HYDRAULIC PRESSES

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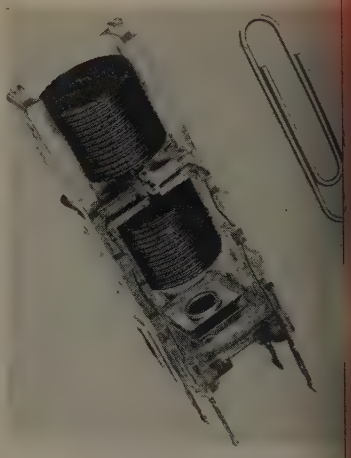
Iron Powder Component

IRON POWDER cores used in Tran radio and television intermediate frequency transformers enable the Automatic Mfg. Cor, Newark, N. J., to build maximu output performance into the small components.

Many of the cores are made a special grade of Plast-Iron powder supplied by Plastic Metals I vision, National Radiator C Johnstown, Pa. This facilitat



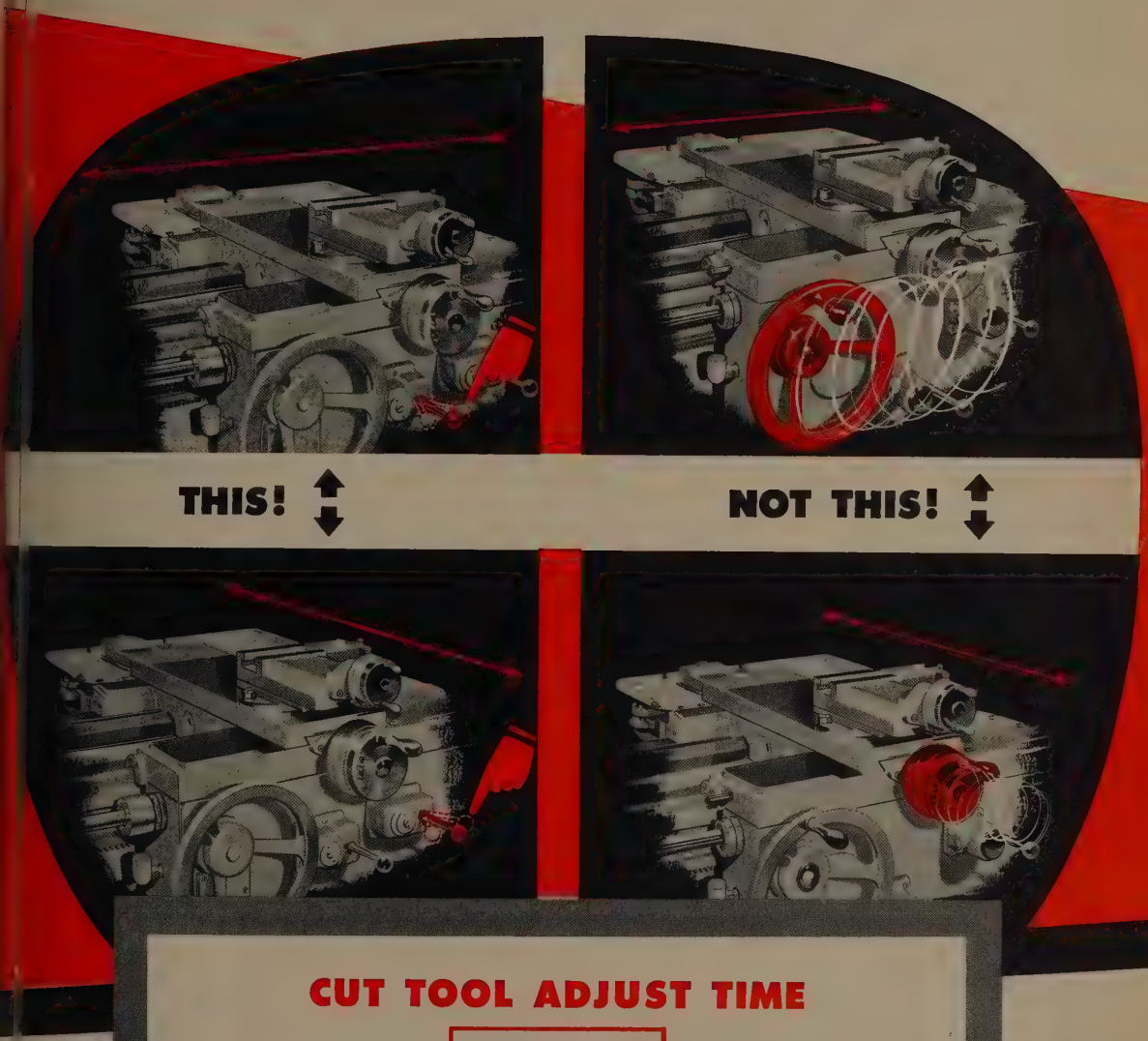
PLAST-IRON POWDER
. . . assures conformity of cores

standardization of some tran formers so more than a doz types can be assembled from a fe components. Set manufacture can hold their inventories to minimum and, at the same tim meet every assembly requireme of tube complement and circu variation in standard broadcast r ceivers.

Another Feature — Simple a positive time saving adjustment provided by these cores. Mechan cally, it requires only a turn or tw to obtain correct gain and respon wave shape, a feature introduc by uniformly high permeabilit and low loss characteristics of t powder in its pressed state.

These qualities are obtained co sistently with the powder becau effective control of particle sizi and other physical and chemic properties mean conformity of di ferent batches. This should a in standardizing procedures f mixing powder with insulating a binding ingredients.

LOOK—NO APRON STRINGS
to tie lathe production down



CUT TOOL ADJUST TIME

50%

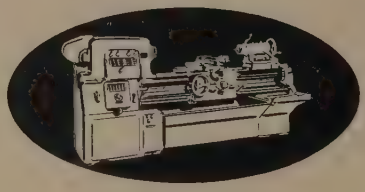
. . . Why tie Production down—when with just 2 Fingertip Apron Feed Levers, you can get Rapid Tool Positioning—Quick Tool Retraction—Fast Carriage Return—Improved Operating Ease—Greater Productivity.

SEE next 3 pages for details of the great new MONARCH Series 61 Lathes.

ANOTHER FIRST FROM MONARCH MACHINE TOOL COMPANY

FASTER PRODUCTION

The Great NEW Monarch Series 61 Lathe—with Fingertip 4-Way Power Rapid Traverse

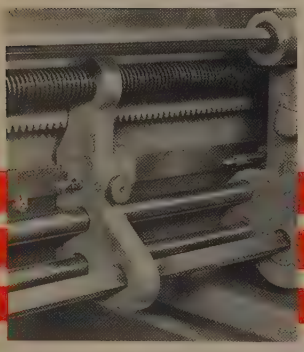


Here's a lathe to warm an operator's heart. And why not? He expends much less effort; yet produces more. The Series 61 is a machine he goes for . . . in a big way.

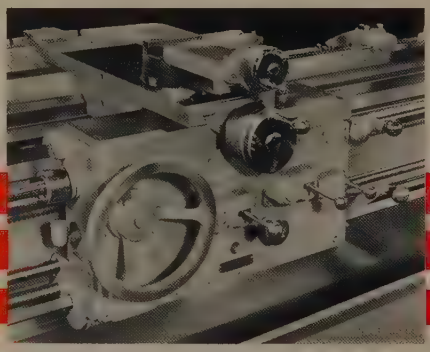
Monarch has scored another FIRST by putting *all* tool movements under power, right at the apron. This indeed is the control center of the machine. Close to it the operator spends 90 to 95% of his time. Nothing could be more logical than making it possible for him to do a better job easier at this critical position.

In addition to the Series 61 four-way power rapid traverse which slashes tool adjust time 50%, this machine includes such typical Monarch production features as **(1)** totally enclosed gear box and end gearing, **(2)** automatic pressure lubrication, **(3)** anti-friction bearings by the score, **(4)** ground or shaved helical gears in headstock, **(5)** American standard Camlock spindle nose, **(6)** flame hardened and precision ground integral bed ways and **(7)** all critical parts made of hardened alloy steel.

The foregoing numbered features are time-proved in the field, having won their spurs on other models of Monarch lathes. They are your guarantee that the Series 61 lathes are unequaled for accuracy, versatility and dependability. Want more information? Send the coupon (second page following) for our complete Series 61 Brochure #1124 . . . . . *The Monarch Machine Tool Company, Sidney, Ohio*



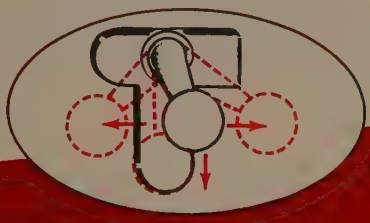
BRIGHT IDEA! Long bed Series 61 models boast these unique new traveling rod supports for leadscrew, feed rod, traverse rod and control rod. Without attention on part of operator, they're carried along—then re-positioned — as carriage travels.



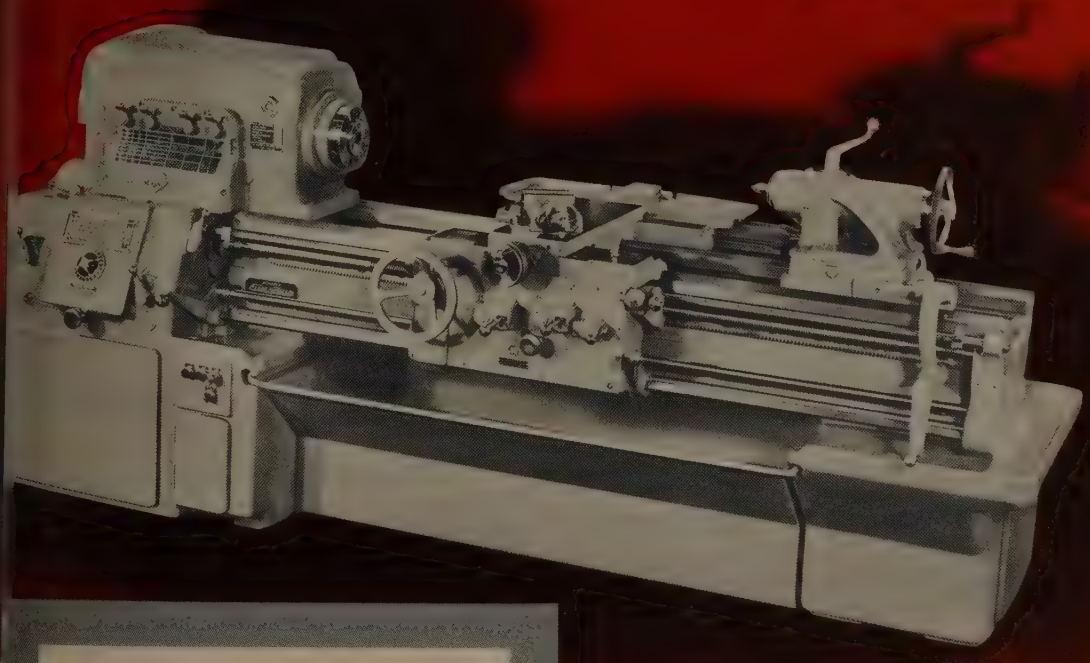
INSTANT, EASY CONTROL! Movement of longitudinal friction lever right or left actuates instant rapid traverse in direction of movement. Downward motion engages feed. Cross feed friction lever gives similar action to cross-slide. Quick —easy—a great time-saver.

BUILT-IN DIRECT LENGTH READING DIAL! Usually furnished as an accessory at extra cost, the direct length reading dial is a built-in feature of the Series 61 and contributes to its accuracy and speed. This feature, used for multiple diameter turning or boring is especially valuable when boring blind holes.

ASIER OPERATION



CUTS TOOL ADJUST TIME **50%**



Monarch 16″ Series 61 Lathe . . . representative of *the first and only complete line of lathes with inbuilt power rapid traverse.* Available in Engine and Toolmaker's Models — 13″, 16″, 20″ and plus-swings in all three sizes.

Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A GOOD TURN FASTER—TURN TO MONARCH

Continued on next page →

Continued from preceding page

50% LESS TOOL ADJUST TIME

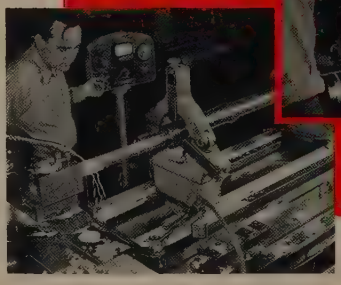
A BIG SAVINGS ON JOBS LIKE THESE

The more intricate the job, the more you save with the four-way power rapid traverse of the new Monarch Series 61 Lathes (see preceding pages). With a two-way longitudinal movement of 160″ per minute—and a two-way cross movement of 75″ per minute—you can see that the more tool adjust time needed for jobs on older lathes, the greater the savings on floor-to-floor time on the Series 61.

For further time-saving on both small lot runs and high production work, the Series 61 can be equipped with any one of 3 Monarch tracer controls—the Air-Gage Tracer, Monarch-Keller and Motor-Trace. Here's a machine with possibilities no lathe user can afford to ignore. Send coupon today for your copy of our Series 61 Brochure #1124.

TURNING

FACING



BORING

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TURNING MACHINES

TOOLMAKER'S LATHES—10″ to 20″

ENGINE LATHES — 10″ to 32″

THE MONA-MATIC
for high production metal turning

THE SPEEDI-MATIC
a fast, precision hand screw machine

THE MONARCH MOTOR-TRACE

THE MONARCH-KELLER TURNING MACHINE

THE MONARCH AIR-GAGE TRACER

THE MONARCH ROLL TURNING LATHES

THE SHAPEMASTER ENGRAVER

SPECIAL TURNING MACHINES

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio

Gentlemen:
Please send me without obligation your complete illustrated Series 61 Brochure #1124

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Tube station is in front of production control board in central control room. Each machine has its file

TUBES Streamline Production Control

perience of this company has been that produc-n control is no better than the production control stem. Here tubes connect departments

EY to effective production con-l is the elimination of delay in e production control system it-lf.

This has been the experience of liance Electric & Engineering . At its Ashtabula, O., plant, here electric motors and power its for drives are made, the ntral control room and three re-ote dispatch booths (receiving, achine shop and fabricating and elding) are linked with an Air-be system—a product of Lamson orp., Syracuse, N. Y.

Setup — Orders are first proc-ssed in the production planning epartment, where materials are ordered and manufactured components listed. Production control then schedules production of each part with reference to the delivery date. A master production control form (along with six copies) is made out.

Copies include: 1. Identification —accompanies order throughout production; 2. production record—remains in central control room as record of progress; 3. stock material requisition — forwarded to stock material department; 4. route card—goes with order only when it is moved between production points; 5. cost department—for recording cost; and 6. dispatch booth copy—goes through tubes to machine shop booth, then to fabricating and welding booth.

A white operation card is also prepared for each machine operation. They are filed in two ways at the central control room—operations scheduled in a particular sequence and those awaiting scheduling.

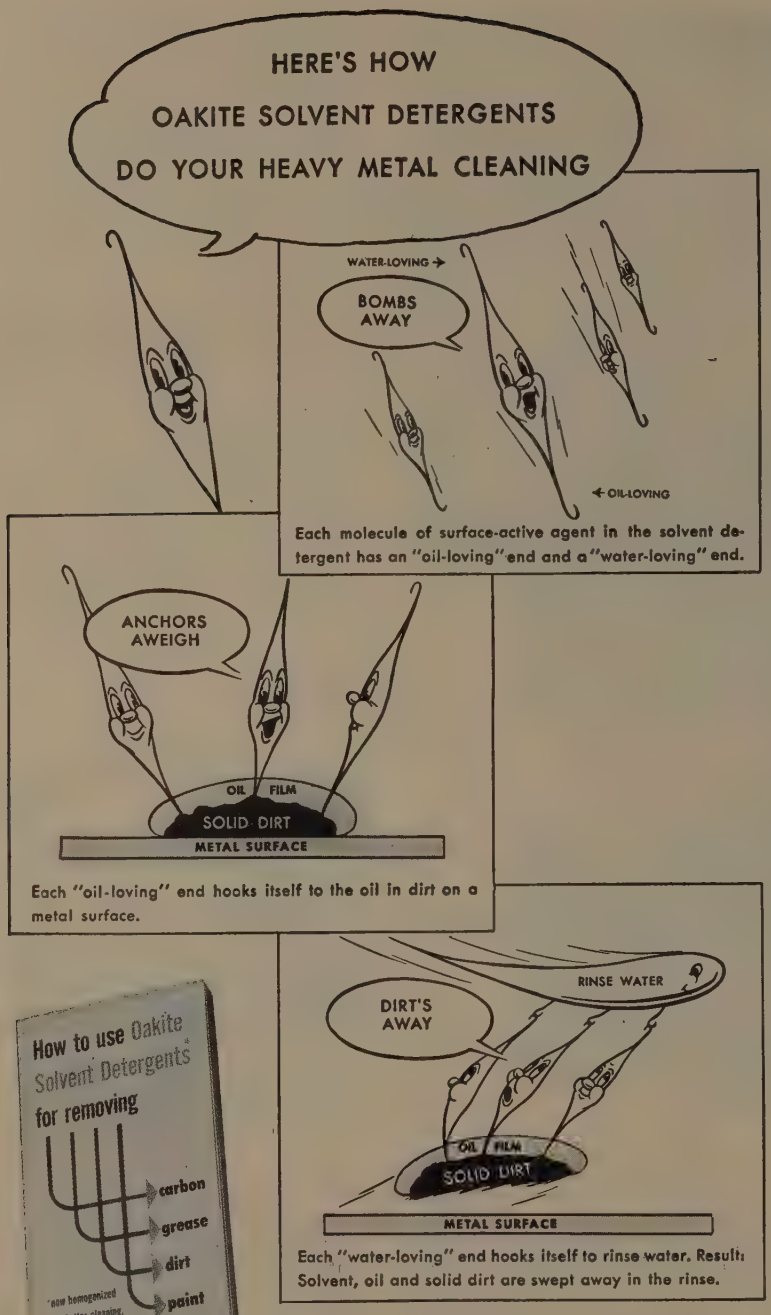
Dummy Run—To begin a manufacturing operation, the dispatch booth copy and appropriate operation copies are sent through the tube to the machine shop. There operation copies are placed on a small production control board until delivered to foremen.

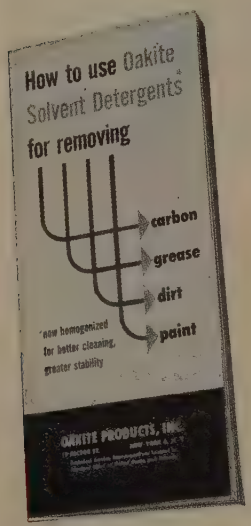
Meanwhile, the stock material requisition, identification and route card copies are dispatched to the stock room. Parts are issued; identification cards are attached, and route card copies are given to the mover who delivers the parts. After parts are moved, the route card copy is returned to the central control and is attached to the production record copy.

When machining operations are completed, the dispatch booth and operation copies are returned through the tube to the central control room, where they are inserted into proper pockets on the main production control board for operations in the fabricating and welding department.

In a similar manner, production control copies are conveyed through the tubes to the dispatch booth in the fabricating and welding department.

Dispatch booth in machine shop has small production control board. Here foremen pick up operation copies


HERE'S HOW
OAKITE SOLVENT DETERGENTS
DO YOUR HEAVY METAL CLEANING
WATER-LOVING
BOMBS AWAY
OIL-LOVING
Each molecule of surface-active agent in the solvent detergent has an "oil-loving" end and a "water-loving" end.
ANCHORS AWEIGH
OIL FILM
SOLID DIRT
METAL SURFACE
Each "oil-loving" end hooks itself to the oil in dirt on a metal surface.
RINSE WATER
DIRT'S AWAY
OIL FILM
SOLID DIRT
METAL SURFACE
Each "water-loving" end hooks itself to rinse water. Result: Solvent, oil and solid dirt are swept away in the rinse.



Oakite solvent detergents make it easy for you to remove heavy soils such as drawing and buffing compounds and thick deposits of other oils and greases. Oakite solvent detergents may be used in spray washing machines or in tanks. They offer many advantages: speedy removal of stubborn soils, safety for all metals, economy, reduction of fire hazards, protection against rusting.

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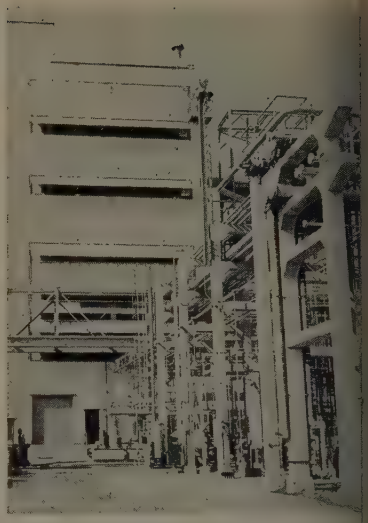

Epoxy Supply Tripled

One of the world's largest epoxy resin plants has started production in Houston, Tex., by Shell Chemical Corp. Shell will also open a bis-phenol-A plant, making the Houston plant independent of outside suppliers of Epon

High-Speed Broaching

AN ELECTRICALLY controlled broaching machine with hydraulically actuated fixtures is designed by Colonial Broach Co., Detroit, to be used in a wide range of broaching operations. The standard 25-ton machine, with double-acting mechanical drive, has a maximum stroke of 130 inches.

Ram speed is variable from 30 to 150 sfm in both directions. The ram speed and length of stroke can be increased to meet even higher requirements for specific broaching operations.

Design of the broaching machine makes it suitable for various types of worktable construction such as trunnion, rotary and shuttle. A job control panel is provided for use in setup and tryout. Width of the ram is 24 inches. Automatic pressure lubrication is used throughout.

Statistics—The machine requires 194 x 290 inches of floor space, including all cabinets and motor-generator set. Over-all height is 96 inches; gross weight is approximately 80,000 pounds. Drive for the ram is supplied by a direct-current motor rated at 150 hp at 750 rpm.

intricately machined MAX-EL alloy steel part shows minimum distortion after heat treatment...

Halliburton Oil Well Cementing Company, Duncan, Oklahoma, selected hot rolled MAX-EL 3½ bar stock for the valve shown. It's an important part of their 5⅞" tester, used to sample fluids or gases during drilling operations, sometimes 15,000 to 20,000 feet below the surface.

The valve is machined in the annealed condition and then heat-treated. Even though it varies considerably in thickness, no distortion problems are encountered in this MAX-EL part.

Try MAX-EL in your shop. You'll like its better machinability, freedom from distortion and over-all quality. And you'll get longer tool life . . . more pieces per grind. Call Crucible for immediate warehouse delivery of MAX-EL steels.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **ALLOY STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

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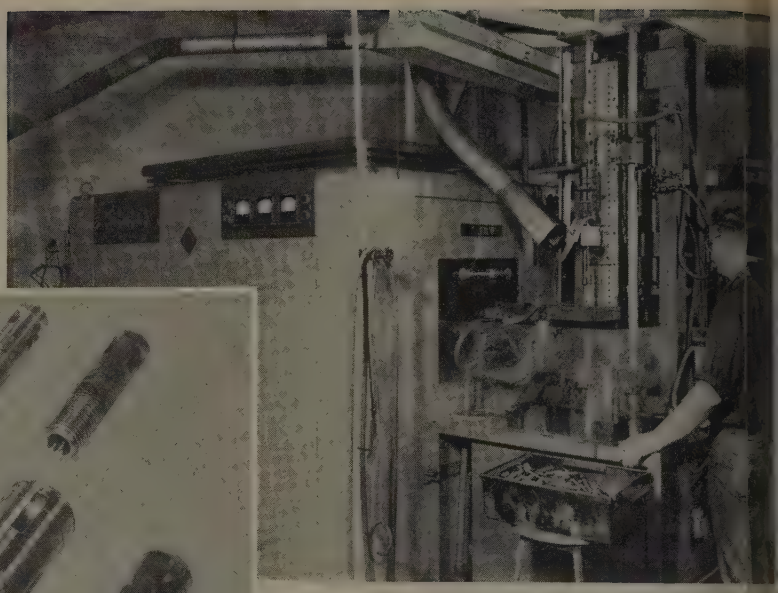
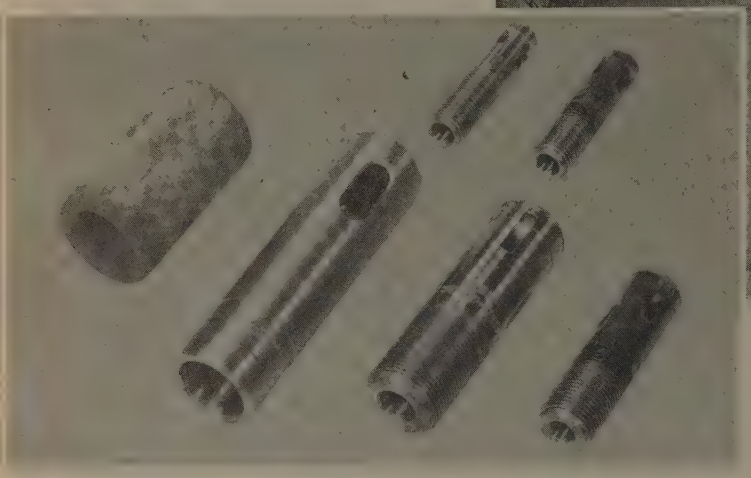


Scully-Jones uses this 50-kw induction heater and versatile automatic work handling equipment to harden desired case without warpage or scaling



A sample of some of the parts being hardened is shown in the photo inset

rf HEATING SIMPLIFIES HARDENING

With a wide variety of sleeves, adaptors, quick-change chucks, boring bars, chuck collets, etc. to harden, this company needed versatility. Induction heating was the answer

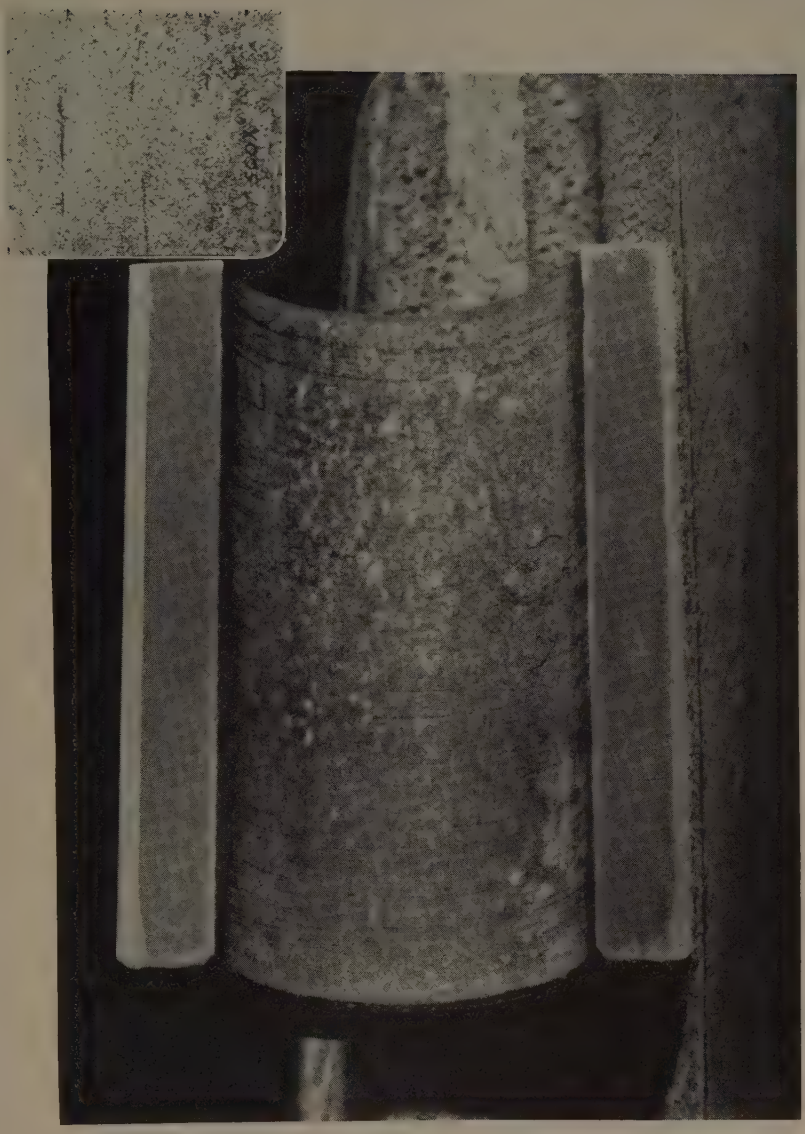
VERSATILITY of radio frequency heating and its ability to produce a better product are being demonstrated successfully in a variety of hardening operations at Scully-Jones & Co., Chicago, employing a single heater with a specially designed fixture.

The work includes hardening adjustable adaptors up to 1⅞-inch in diameter, steel sleeves up to 3½ inches in diameter, quick-change chucks, boring bars, chuck collets, etc.

Automatic Fixture—These pieces are being hardened by means of a 50-kw Allis-Chalmers induction heater fitted with an automatic progressive hardening fixture mounted on casters and securely bolted to the machine's work side. This fixture incorporates a carriage with adjustable centers capable of handling steel shafts up to 41 inches long. Air cylinders and hydro-check devices provide vertical drive for the carriage.

Also bolted to the heater is a 30 x 40 x 56-inch work table mounted on casters. The table has a 12-inch deep stainless steel quench sink supplied with a standby pipe to provide a 10-inch water depth for immersion quenching. Where spray quenching is required a ¾-inch solenoid valve is used

By OTTMAR W. NOESKE
Electronics Section
Allis Chalmers Mfg. Co.
Milwaukee



Uniform case depth of 0.030-inch is evident in the sectionalized portion of the steel bar above. Inset shows detail of grain structure in the case

n no water or quenchings are ne ed, a Transite table top is en oyed.

ontinuous Operation—A two-st on coil extension consisting of tw bus bars controlled by a selec-ti air-powered device is electric-al interlocked with the progres-si hardening fixture and the in-du ion heater. As a result, power ca be applied to the desired work st ion while loading or unloading th remaining work station.

ardening of 1 to 3½-inch diam-et steel shafting is accomplished b placing the shaft or bar stock in a vertical plane by means of th two centers of the progressive h dening fixture. Thus, the part is eld in position with respect to th work coil and quench ring m anted on the bus bar extensions.

leat Cycle—At the start of the h t cycle, the leading edge or end o the shafting or bar stock is p itioned within the coil, and after a hort dwell period, the shaft is m ved downward through the work c and quench ring. As the trail-i end of the shaft or bar stock p ses through the work coil and q nch ring, the heater is auto-m tically shut down, the treated s ft removed, the progressive fix-t e reloaded, and the entire cycle i repeated.

Uniform case hardness and depth i attained by means of this radio f quency heating operation with o ly minor scaling which is usually o little consequence and can be l ished off. A uniform case depth o 0.030-inch is evident in the sec-nalized portion of the steel bar the accompanying photo.

No Thin Oxide Layer—Even the thin oxide layer which may form during a radio frequency heating cycle can be eliminated by utilizing somewhat greater radio frequency power. When heating parts under oil or water with radio frequency energy, there is little possibility of decarburization.

Radio frequency heating coupled with properly designed work coils and handling equipment is able to eliminate distortion of parts due to heat treatment. Distortion is often reduced by rotating the parts within the work coil so as to overcome any possible irregularities or variance in coupling between the work coil and part. Radio frequency heating does not affect the layers of the part beneath the surface, hence no displacement or forces are developed to cause distortion.

You Get A Tight Grip on Quality and Costs With Townsend Locknuts

Quality and costs are controlled firmly when you use Townsend locknuts in product assembly. They are designed to apply positive pressure to keep bolted connections tight at all times even under severe vibration and shock. Lockwashers, double assembly and double inventory are eliminated for increased efficiency.

Through use of special organic inserts, Townsend locknuts grip the bolt securely—stay put under a variety of adverse conditions until removed with a wrench. Both inserts resist moisture, dryness, gasoline and lubricants.

The Townsend Nylok Nut* on the left is cold forged to provide added strength in the body and threads. The locking element in the nut is a tough nylon plug insert in one hex face which projects beyond the crest of the thread. When the nut is run down on a bolt, the highly resilient nylon is compressed but not cut by the bolt threads. Its spring-like action grips threads tightly and sets up a counter-thrust, creating strong metal-to-metal wedging of bolt and nut threads. When a Townsend Nylok Nut* is removed, the insert seeks to return to its original shape, giving great reusability. This also makes it possible to lock the nut in any position on the bolt—seating is unnecessary.

The Tufflok Nut* on the right is also cold forged in one piece for added strength in the body and threads. It has an exclusive petal design to assure staking of the hexagonal fibre insert. This provides a positive grip on the bolt at all times, since it cannot loosen or turn in its seat. Tufflok Nut* is an approved AN 365 part for use in aircraft.

Townsend locknuts are available in sizes #4 through ⅜ inch. For further information send the coupon below or write to us today.

*Licensed under the Nylok Corporation patents.
Tufflok is a registered trademark of Townsend Company.

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Sales Offices in Principal Cities
Cherry Rivet Division: Santa Ana, California

In Canada: *Parmenter & Bulloch Manufacturing Company, Ltd., Gananoque, Ontario*

TOWNSEND COMPANY
Sales Department
New Brighton, Pa.

Please send to me without obligation Locknut Bulletin TL-63.

Name _____ Title _____
Company _____
Street _____
City _____ Zone _____ State _____

Two Furnaces in One

Rockwell furnace, for annealing o stress-relieving castings and oth miscellaneous ferrous pieces, has maximum work load capacity o 50,000 pounds. Hot air recirculatin is provided for 1275 to 1600°F, t maintain uniform heating quali throughout the charge. For high temperature heating, fan is not us and ducts are closed by damps

Computer Holds Solution

A HIGH speed, moderately pric electronic computer has been a nounced by Bendix Computer D vision of Bendix Aviation Corp. digital differential analyzer, t computer has been under develo ment for two years.

The machine utilizes the decim numbering system in both progra ming and in calculating solution making it extremely simple to o erate. The fundamental operatio of the machine is the numerical i tegration of any variable with r spect to any other variable, line or non-linear, which generates third variable. Integrators may a so be coded to perform additio multiplication, division, compar son, limiting, decision and ser operations. It has a capacity 60 integrators.

Solves Complex Problems — Th computer easily and reliably ha dles the numerical solution of li ear and non-linear differenti equations, or simultaneous sets such equations. It may be em ployed to solve integral equation split-boundary value problems, an individual or simultaneous sets linear or non-linear algebraic an

scendental equations. It may pplied as a numerical simulator certain physical phenomena.

utomatic programming of the hine is provided for by punched e prepared by the electric type- er, or the computer may be ually coded through the opera- of the monitor control panel. imal solutions to a problem are veniently displayed in both tab- ted and graphical form. The fulness of the computer has n greatly extended by provid- a means of recording solution a on punched tape for later use other computations. Graphical ormation and tabulated data y be used by the computer dur- computations. The information recorded on punched tape and s not affect the computer's ed of operation.

ncentrating on Carbides

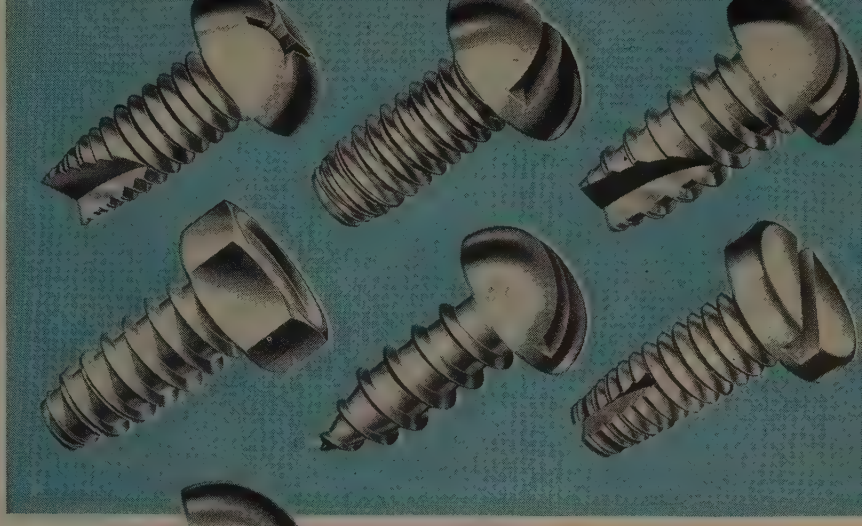
An all-industry carbide institute ll be conducted by the University Pennsylvania's Mechanical En- neering Department during Tool- g for Production Week in Phila- phia Apr. 26-30. Program coin- es with the 1954 Industrial Ex- sition & Convention of American ciety of Tool Engineers at Phila- lphia's Convention Hall.

University officials feel that by mbining the educational talents the university, knowledge of car- de manufacturers and experience the tool engineering fraternity, dustry should get considerable thoritative information on the bject. Sessions will be restrict- l to morning hours.

elding Procedures

An explanatory, step by step m on welding rod and electrode chniques and procedures is of- red by Eutectic Welding Alloys orp., Flushing, N. Y. The film, New Welding Procedures," is in olor with cound, and takes 19 min- tes.

Latest developments in torch and netallic arc welding are shown in ypical operations. Chamfering, utting and grooving without dis- antling and without dangerous verheating are shown by operators who use these special-purpose elec- rodes on routine jobs.



You Get Economical, Quick, Secure Fastening with Townsend Tapping Screws

You enjoy the economy of quality when you use Townsend tapping screws. They are made to provide an easy method of securely fastening metal, plastics, wood, asbestos and compositions with efficiency.

The use of Townsend thread forming screws eliminates costly tapping operations as the precision-rolled thread forms a mating thread when the screw is driven into the material. They are widely used in sheet metal, castings, and a variety of non-metallic materials. They may be removed and replaced without impairment of their holding power.

Townsend thread cutting screws have an off-center slot which presents a true, sharp, thread-cutting face which acts as a tap when the screw is driven into an untapped hole. By cutting their own threads, these screws fit tightly and resist loosening from vibration. There is no chance of size discrepancy between screw and tapped hole.

Townsend tapping screws are available in the types shown here in a variety of head styles with slotted or Phillips recessed and hex heads. They are but one group of the Townsend family of 10,000 types of standard and special fasteners and small parts used by all industry to improve assembly and speed production.

As representatives of "The Fastening Authority" Townsend engineers can draw upon 138 years of accumulated experience in wire drawing and cold forming to help solve your fastening problems. You can depend upon Townsend to give you excellent service in any quantity. For additional information on the economy of using Townsend tapping screws, send the coupon below or write.

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Please send to me without obligation Tapping Screw Bulletin TL-88.

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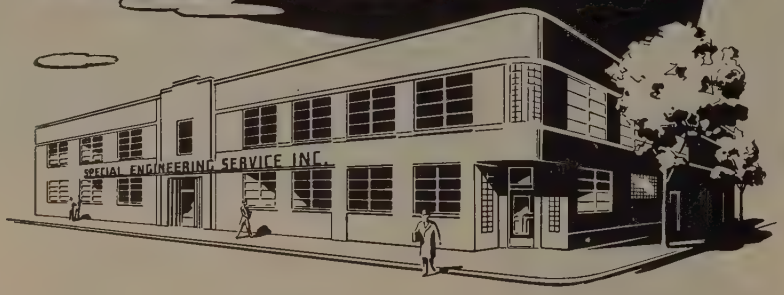
Here's a Valuable Supplement to your own Engineering Department!



Yes, here is the talent you need, when you need it, to supplement and assist your existing engineering facilities without adding one penny to your present overhead! And your assurance of satisfaction is our record of fifteen years' steady growth and progress.

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Development
Survey
Illustration

PLANT SERVICES

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Processing
Plant Layout
Machine and
Equipment Surveys

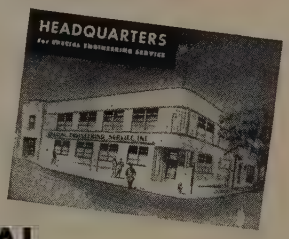
ASSISTING SERVICES

Tool Procurement
Expediting
Inspection

Our company's stability, along with a progressive profit sharing plan, has attracted a large staff of versatile engineers who have skill and practical experience in both tool design and application, as well as in modern production methods. Our constant aim is close cooperation with your personnel. The result we seek is to help them develop the product, tooling method or production operation which will turn the most profit for you. Also of value to you is our reputation for prompt service. In fact, our company plane will fly staff members right to your plant for consultation *within hours after you request it!*

LIKE TO KNOW US BETTER?

This informative brochure will serve to acquaint you with our complete facilities and services. Please write for your free copy. We also manufacture "SESCO" tool room accessories and press room equipment. Literature on these products will also be sent to you without obligation.



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Energy Loss In Steel

A STUDY of magnetic domains electrical steels is being conducte by U. S. Steel's Research and D velopment Laboratory, Pittsburg Purpose is to find causes of energ losses in electric motor and tran former cores.

Power losses in transformers a attributable to the characteristi of the steel used in making core

ELECTRICAL STEEL STUDY
. . . third power loss is anomalous

There is a measurable loss throug hysteresis, or lag behind the fiel when steel is magnetized by magnetic field made to var through a cycle of values. An other loss is created by eddy cur rents, or induced electric current which lower efficiency and in crease temperature of rotatin metallic objects in a magneti field. Since these two losses do no add up to the total core loss, third cause is being sought. Thi third and unknown factor is calle anomalous loss.

Orientation Control—It is be lieved that certain magnetic do main orientations might furthe improve the directional propertie of grain-oriented steels. Presen research into magnetic domains i to determine their characteristic and possibly to discover ways t control their orientation.

Swarf Problem Solved

A problem facing engineers of Norton Co.'s Grinding Machine Di vision in developing the CM-1 heavy-duty multi-wheel grinde was elimination of grinding swarf

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. . . performance

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IT'S

WALLINGFORD

Steel Tubing

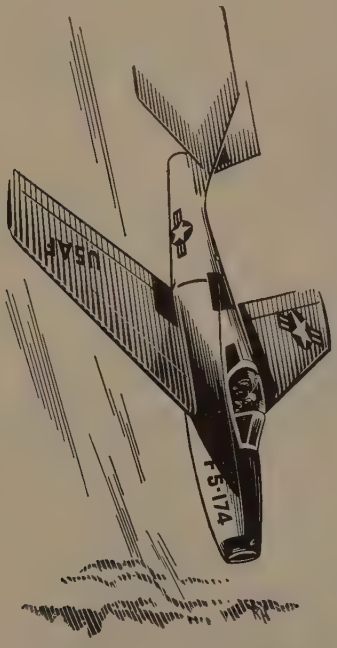
THE REPUBLIC F-84F THUNDERSTREAK

A mainstay in the defense of the free world, this new fighter-bomber exceeds in all performance categories any previous Air Force fighter or fighter-bomber type.

The catapult seat for this hot, new fighter-bomber had to combine light weight with rugged strength to resist shock and protect the pilot. Only the finest construction would do . . . there could be no compromise with dependability or quality. That's why Wallingford Steel Tubing was selected for the frame.

Like the Republic Aviation Corporation, many other satisfied tubing customers have learned that there's no source like Wallingford when it comes to meeting the most exacting specifications ***exactly*** and ***consistently***.

Whether your problem concerns strength, analysis, concentricity, diameter or uniform wall thickness, Wallingford has the experience, skill and modern equipment and productive capacity needed to deliver tubing just right for your requirements. Phone us today and let us know what you need.



WELDED ORNAMENTAL, MECHANICAL, PRESSURE AND SANITARY TUBING and PIPE IN STAINLESS and CARBON

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CO.
WALLINGFORD, CONNECTICUT, U. S. A.

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS • STRIP and TUBING

produced by the several grinding wheels cutting simultaneously.

In this machine, several grinding wheels are mounted on a heavy-duty spindle between cartridge-type bearings. In a single cutting plunge, these wheels grind multiple diameters which may be of different dimensions.

Under ordinary circumstances downtime required to remove grinding swarf from wheels would be considerable. To eliminate this, Norton engineers provided for continuous and automatic removal by adapting components of the Dempark filter made by Industrial Filtration Co., Lebanon, Ind.

The unit thus composed consists of a chain-belt-type conveyor, on which rides a strip of disposable filter material. The conveyor forms a trough into which the used coolant falls. As the filter medium becomes loaded, a float control advances the conveyor to bring clean filter material into position. The filtered swarf is collected on the filter medium in a metal receptacle for easy disposal.

Stainless Steel Valve Discs

Non-harenable chromium-nickel steels used in check valves are frequently too soft, necessitating costly nitriding for wear resisting surfaces. Then too, valve parts made from standard hardenable stainless such as Type 410 and Type 416 are sometimes too hard and are subject to cracking and distortion resulting from grinding or heat treating operations involved in their fabrication and service.

One valve manufacturer found the answer in Armco 17-7 PH stainless steel. In the soft condition, this alloy can readily be formed and blanked into check valve discs. Proper hardness without appreciable distortion is attained by a double low-temperature heat treatment. Held at 1400° F for 1½ hours, air and water cooled to 60° F within one hour, then heated to 950° F for ½ hour and air cooled, 17-7 PH develops a hardness of Rockwell C-41 minimum.

The treatment produces a C per cent offset yield strength of 165,000 psi minimum in tension or compression.

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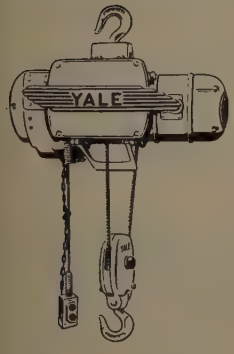
Get complete information from the YALE Sales and Service facilities located near you. Or mail the coupon.



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NEW PRODUCTS and equipment

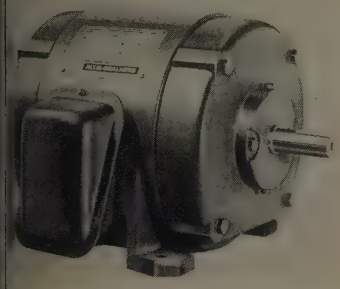
Reply card on page 133 will bring you more information on any new products and equipment in this issue

duction Motors

. . . conform to NEMA standards

Allis-Chalmers announces a com-ete new line of alternating cur-nt squirrel cage induction mo-rs in frame sizes 326 and naller.

The new design of frame sizes to and including 326 follows the



wly established NEMA stand-ds. The new models will have st iron frames and end shields. otor will be pressure-cast of uminum. Bearings will be ease-lubricated, medium series, uble shielded ball bearings, cap-le of relubrication without dis-antling the motor. Stator wind-gs will be the random or mush ound type of heavy Formvar-ated wire in semi-closed slots. ator will receive multiple dips d bakes to assure protection gainst moderate amounts of mois-re, weak acids and alkalies. Al-s-Chalmers Mfg. Co.

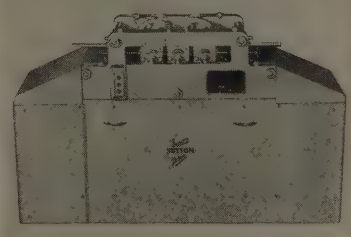
MORE DATA CIRCLE NO. 1 ON REPLY CARD

raightening Machines

. . . for use on small diameters

Known as the Syncro-Drive, a wly designed straightener has horizontal pass line between two iven rolls opposed by three smaller pressure adjusting rolls. The five rolls are motor driven and the machine operates without guides.

To be utilized for straightening



tubes and bars of small diameter, the center distances between all rolls are adjustable and all five rolls are angularly adjustable. The extreme flexibility claimed for the machine permits accurate straightening over a wide range of sizes and grades of material. Sutton Engineering Co.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Automatic Drilling Machine

. . . drills without layout

An electro-mechanical unit automatically drills a center hole on

a flat metal sheet of any shape as well as on castings without layout. Developed by Hillyer Instrument, it will also drill Bakelite, slate and marble, crackle finish metal, etc.

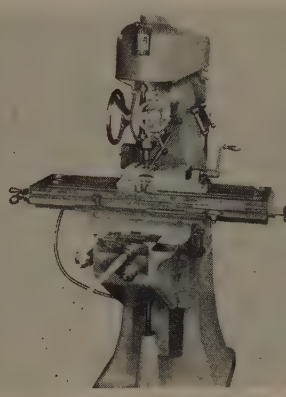
Hole location is reduced to X and Y dimensions being set on decimal dials in a control board which is separate from the machine. The operator presses a button to put the machine in motion. The drill automatically positions itself and drills the hole to a predetermined depth. Any number of holes can be located and drilled in quick time. Hillyer Instrument Co.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Milling Machine

. . . large-capacity, flexible

An answer to accurate vertical and angular milling problems is offered in the form of the United



States vertical milling machine by U.S. Burke Division.

Balanced rigidity, conveniently mounted switch and tool storage compartment are features incorporated in the model. It was designed to fill the need for a large-capacity vertical milling machine which is extremely flexible, yet reasonably priced. The vertical

table provides an expansive 9½-inch by 36-inch working surface. Quill travel is 5½ inches. The head is accurately balanced by a motor mounted behind the support column. Weighing approximately 1600 pounds, it has a stable base and requires 60 by 75 inches of floor space. U.S. Burke Machine Tool Division, Cincinnati Mfg. Corp.

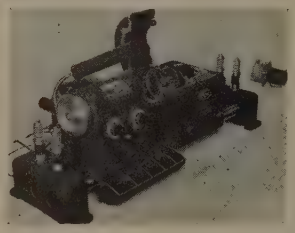
FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Balancing Machine

. . . offers increased production

Among prime considerations in developing the Under-Drive Moto-Blower Balancer were high production rates and operator safety.

It is designed for balancing complete motor and blower wheel assemblies such as are used in automotive air conditioning units,



etc. Work, consisting of the blower wheel unit assembled on its motor shaft, is driven by means of a constant speed belt drive arrangement which automatically engages the under side of the blower wheel as work is positioned and gravity held in the special rapid-loading fixture. No clamping is necessary. The under-drive belt arrangement is adjustable to accommodate blower wheels ranging from 2 inches to 8 inches in diameter. Rapid deceleration of the work is accomplished by electro-dynamic braking. R. B. Annis Co.

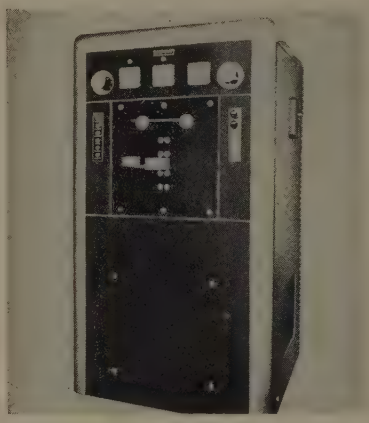
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Induction Heater

. . . redesigned to conform

A redesigned 5 KW high frequency heating unit is offered by Lindberg Engineering. It is applicable to soldering, brazing and light heat treating operations.

It incorporates a heavier sheet steel cabinet for rugged industrial use insuring minimum RF radiation and fully complies with FCC regulations. Interior steel partitions are provided to isolate oscillator, power and control components which are accessible for inspection through large access



doors. The Checklite system of indictating lamps has been relocated to the cabinet. The temperature controlled water cooling system has been redesigned to reduce water consumption and to eliminate any possibility of moisture condensation on internal components and work coils. Lindberg Engineering Co.

FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Dual-Purpose Respirator

. . . filters dust and vapors

One respirator has been designed to protect the wearer from toxic dusts as well as organic vapors.

The MSA Confo Chemical Cartridge Respirator employs static-web dust filters which clamp on the respirator's twin chemical cartridge filters. The dust filter is made of charged, resin-treated felt which promotes electrostatic retention of dusts and supplements mechanical filtering action. Cartridges and filters are independently replaceable allowing greater economy in supplying parts. Mine Safety Appliances Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Compressible Liquids

. . . compressibility, lubricity

Compressible liquids known as Wales Comproils used in Wales Hydra Springs have been made available.

The development combines the principle of liquid compressibility

at ultra high pressures with lubricity. One of the wide uses of Wales Comproils is in cushioning applications. They also have varied usage in hydraulic systems. Wales-Strippit Corp.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Tool Holder

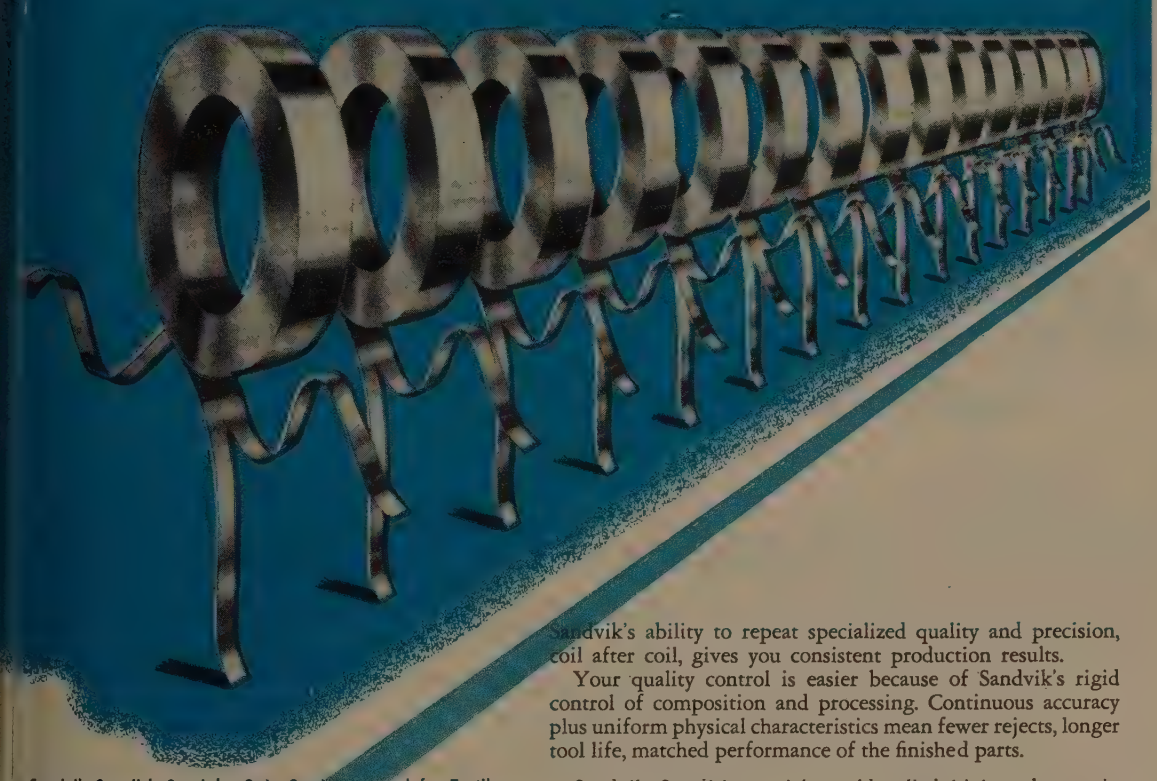
. . . for firm gripping

A simplified design, rugged construction and the elimination of wear areas are claimed by the manufacturer for the Wej-Lok tool holder.

The holder barrel is constructed in one piece. The rectangular wedge is located in the head portion of the holder where it is moved back and forth in its channel by the retainer to either lock or unlock inserted tools. A

Sandvik Spring Steel's *Matched Performance*

gives you continuous quality production



Sandvik's ability to repeat specialized quality and precision, coil after coil, gives you consistent production results.

Your quality control is easier because of Sandvik's rigid control of composition and processing. Continuous accuracy plus uniform physical characteristics mean fewer rejects, longer tool life, matched performance of the finished parts.

Sandvik Swedish specialty cold rolled high carbon strip steels are available:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- ***Wide range of sizes in stock—also slitting facilities available.***

Ask your nearest Sandvik office for further information or technical assistance.

Sandvik Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical instruments, etc. • Razor Blades • Reeds • Shock Absorbers • A Wide Variety of Springs • Trowels • Vibrator Reeds • Piston Ring Segment and Expanders, etc.

SANDVIK HIGH QUALITY SWEDISH MAGNET IRON STRIP AND WIRE FOR SPECIALIZED ELECTRICAL PURPOSES—Direct Current Relays, Electro-magnetic Brakes, Couplings, Chucks, etc.

Sandvik unalloyed magnet iron has superior magnetic properties—low coercive force, high permeability and good stability after aging. It has excellent bending capacity which eliminates intermediate annealing.

Available in cold rolled strip in thicknesses from .0008" to approximately .197, in widths up to approximately 8". In exceptional cases widths up to 11-13/16" can be supplied. Available in drawn wire up to 19/32" diameter. Contact Sandvik for further details.

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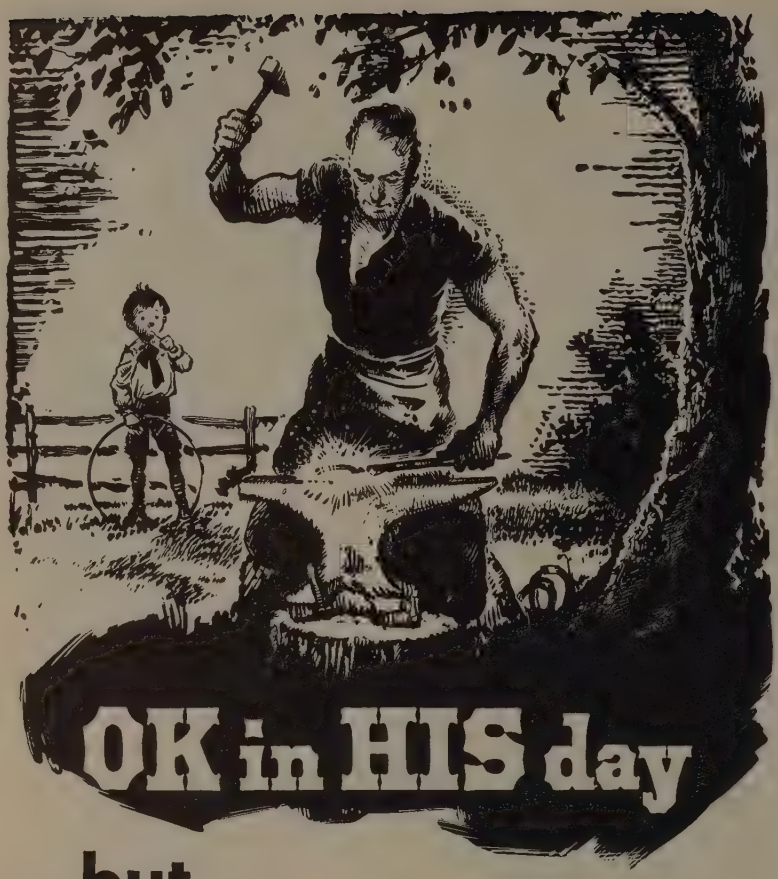
Sandvik Quality Steels

SS-95



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The village blacksmith did well enough forging the relatively few and simple products needed in his easy-going times. But it takes modern equipment and techniques to supply forgings that meet today's exacting standards for strength, uniform high quality and economical, high-volume production.

Thoroughly experienced in producing forgings with proper grain flow for maximum strength . . . pioneers in forging the new wonder metal, titanium . . . Consolidated is your ideal source for ***modern*** forgings. Available to you are our complete and up-to-the-minute facilities including a new die shop provided with the latest die-sinking machines. Modern quality control methods are employed throughout, and skilled personnel provide unequalled forging know-how.

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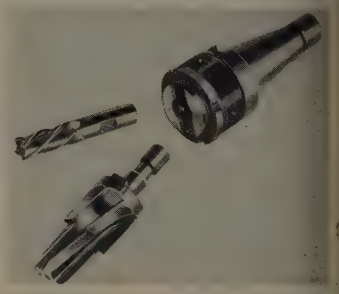
West Coast Representative:
A. C. Stearns Co., 3911 San Fernando Road, Glendale, Calif.

keyed interlocking of retainer an knurled retainer ring cause th two parts to operate as a singl unit. When the retainer ring i



revolved, the retainer is simulta neously actuated and strikes th wedge to move it either to lockin or unlocking position. Detro Reamer Tool Co.

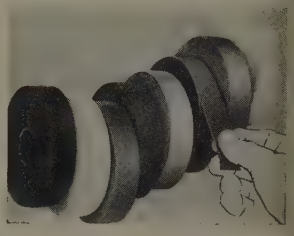
FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Dutch Tape

. . . offers advantage of color

Plastic tape is now available i color.

Dutch Brand Vinyl color tape are suggested for use in colore



wire electronic assemblies, an for indexing, coding, packing, i dustrial decorating, etc. The tap is available in red, yellow, gree blue, gold, silver, black and whit

The tape has high resistance t average destructive elements suc as oil, grease, acids and corrosiv chemical. They are adhesive t steel and resistant to salt wate Van Cleef Bros. Inc., division Johns-Manville.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CAR

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

NFORMATION

AVAILABLE FOR THE ASKING

ide to New Steels

A. M. Castle & Co.—A copy of A. Castle's 1954 stock book makes ilable one of the largest U. S. s of all kinds of steel, includ- latest technical data on new els—leaded steels, leaded al- s and others. It provides also ny pages of time and money- ing facts buyers need when or- ing. Included is assistance in imating regular and special el requirements, charts and les for computing physical perties and machinability.

MORE DATA CIRCLE NO. 11 ON REPLY CARD

ctronic Processing

nternational Business Machines p.—An illustrated booklet cov- significant principles and com- ents of electronic data process- equipment. A brief compari- of the construction and appli- ions of analogue and digital nputers is listed. The booklet plains the organization of dig- computers, and describes brief- the functions of input, storage, thmetic, control and output nponents.

MORE DATA CIRCLE NO. 12 ON REPLY CARD

mented Carbides

Allegheny Ludlum Steel Corp. Carmet Division offers a new tion of the Carmet Methods nual on cemented carbides. The nual includes information on l design, brazing, grinding, p breakers, setups, coolants, ting speeds and reference data. grades of Carmet cemented bides are listed along with ical applications.

MORE DATA CIRCLE NO. 13 ON REPLY CARD

rew Threads

Greenfield Tap & Die Corp.—A -page book is compiled by Greenfield as a genuine handbook of screw thread information. Pitch diameter, limits of taps, tap drill sizes and height of thread, suggested taps and tap drills and limits for threaded products are given for each application.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Unalloyed Titanium

Mallory-Sharon Titanium Corp.—Properties of commercially pure, unalloyed titanium (Grade III) are given in a bulletin containing recommended techniques for fabricating and forming titanium sheet. 4-pages, illustrated.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Safety in Colors

E. D. Bullard Co.—The January-February issue of "What's New In Safety" discusses scientific standardization of safety color, with particular reference to the Bullard safety hats and caps. Lists of the colors and their safety definitions are given.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Zinc-Coated Strip

Sharon Steel Corp.—A fact-packed booklet on Sharon's special hot dipped, zinc-coated strip steel, Galvanite, is available.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Duplex Tubes

Bridgeport Brass Co.—A 12-page bulletin covering duplex tubes and their application is offered by Bridgeport. The detailed text is supported by illustrations and diagrams. A questionnaire included should aid in selection of duplex tubing.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Mechanized Foundries

Link-Belt Co.—Link-Belt's complete line of equipment for the

3-15-54

STEEL
Penton Building, Cleveland 13, Ohio

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mechanization of ferrous and nonferrous foundries, and its use in increasing production and producing better castings, are covered in a new 40-page book. The book should help in selection of a specific piece of materials handling equipment to improve a particular phase of production or aid in planning a completely mechanized foundry operation. Descriptions are supplemented by over 70 pictures of actual installations.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Stainless Steel Selector

Crucible Steel Co. of America—Selector charts designed to help eliminate error in the selection of stainless for specific operations are being distributed by Crucible. Front of the chart contains a comparison of stainless physical and mechanical properties and elevated temperature properties. The reverse side of the slide-rule-type selector gives a large number of the important characteristics of stainless.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Motor Line Review

Allis-Chalmers Mfg. Co.—Three 8-page booklets cover the new open motor, totally enclosed, fan cooled motors and explosion-proof motors built to NEMA specs. Each contains illustrations and charts covering their respective subjects. Charts and dimensions also given.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Jalcase Steel

Jones & Laughlin Steel Corp.—Cold-finished case-hardening Jalcase steels are the subject of a 14-page bulletin just issued. The ten grades of Jalcase, a free-machining open hearth steel with mechanical properties for high quality machined parts are described.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Plant Modernization

Cross Co.—"How to Get the Most Out of Capital Expenditure" is the title of a 16-page brochure prepared by Ralph E. Cross, executive vice-president. It contains, in concise and graphic form, many answers to the problem of plant modernization. It offers informative data on why, how and when expenditure should be made fo replacing equipment. Methods o establishing policies and proce dures are outlined and projecte plans submitted.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Metal Chain

Chain Belt Co.—Rex Z-Meta chain is described in a 10-pag brochure. Benefits to the use are covered and a pictorial preser tation of available Z-Metal chai is included. Average comparativ mechanical properties are als shown.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Fire Protection

National Foam System Inc. – "Foam Fire Protection," a ques tion-and-answer style booklet tell what foam is, how it works, wher it is used and what foam device are used. 16-pages give basic in formation relating to mechanica and chemical foam and their de vices for protection against flam mable liquid fires.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Fabricating and Machining

Twigg Industries Inc.—"Twig Can Do It" describes advance metalworking techniques and fa cilities for fabricating and machi ing high capacity metals int strong, lightweight precision part Its 20 pages take you step by ste through their design, engineerin development and special toolmal ing departments.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Tube Facilities

Central Steel Tube Co.— pages cover Central's steel tubir line. The booklet explains the product and facilities. A few their mill and fabricating oper tions are illustrated. A table giv standard sizes of tubing.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Drill Jig Line

Jefferson Box & Mfg. Co. Swartz Tool Division announces catalog prepared to present the line of drill jigs. 44 pages gi the complete line. Illustrated, di grams.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Annual Product Review

Allis-Chalmers Mfg. Co.—Copi of the 1953 Annual Review of e

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gi ering developments at Allis-C lmers are available. 36 pages of asy reading text and captions. A ong subjects covered: Power ge eration, power distribution, na- al defense.

FO MORE DATA CIRCLE NO. 29 ON REPLY CARD

S vice from Delaware

elaware Steel Fabricating Corp. catalog showing Delaware's fa lities and representative prod- is available. 4 pages, illus- ed, tell the story of Delaware S l.

FO MORE DATA CIRCLE NO. 30 ON REPLY CARD

M gnetic Separators

asco Mfg. Co.—Complete in- fo nation on the construction and u of magnetic separators for h dling steel sheet and plate is t subject of a 4-page catalog. It a describes how the units speed p duction, reduce damage to ma- c nery and eliminate injuries to o rators. Magnet performance c rts and a table of U.S. Stand- ha gages for sheet and plate steel a included.

FO MORE DATA CIRCLE NO. 31 ON REPLY CARD

C ne Carrier

Cook Bros. Equipment Co.—A 6 age brochure is offered by Cook c ering the model CW-312 crane c rier. It describes and diagrams h raulic steering and air brakes f tured on the model, basic com- p ents and basic dimensions. S cifications are also given.

FO MORE DATA CIRCLE NO. 32 ON REPLY CARD

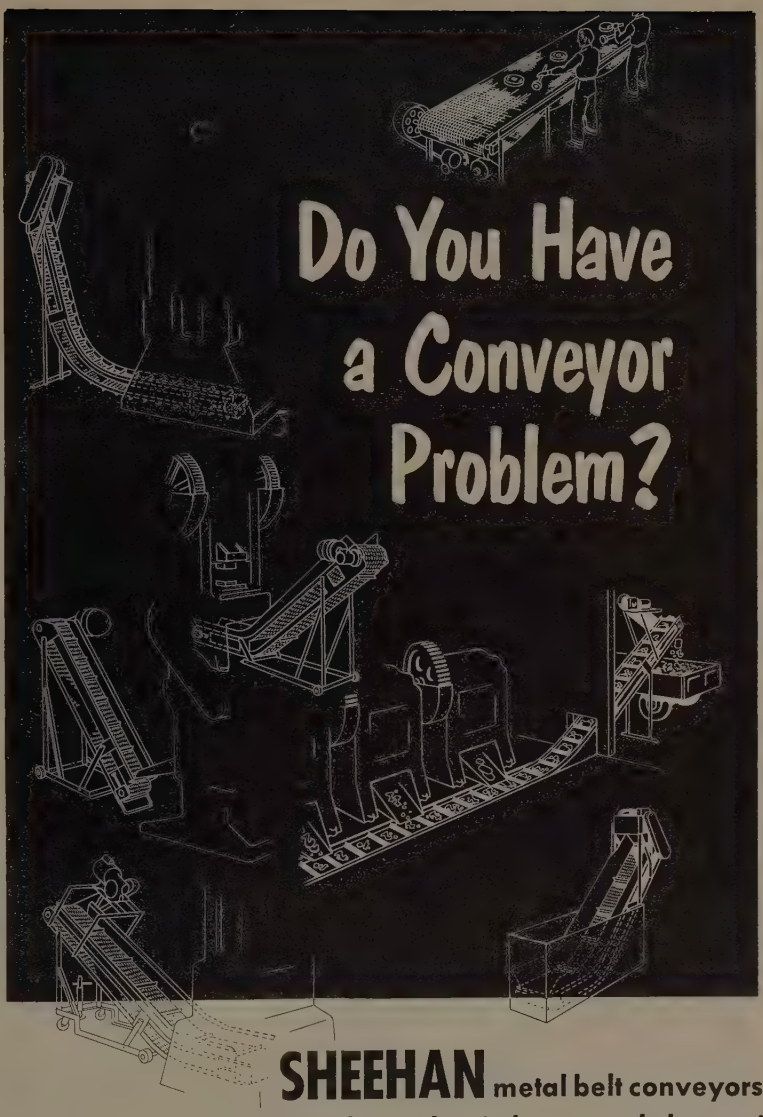
C nduit Wiring

National Electrical Manufactur- e Association—Rigid Steel Con- d t and Electrical Metallic Tub- i sections of the association p sent a simply-written, forth- r ht presentation, which outlines r ognized wiring hazards to be d ected under given conditions c ring the construction of build- i s as well as later when the e trical systems are in operation. I shows how use of rigid conduit w ring can obviate many risks.

FO MORE DATA CIRCLE NO. 33 ON REPLY CARD

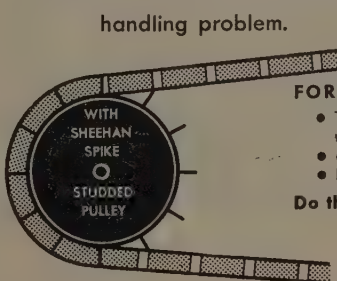
P wer Pipe Machines

Bever Pipe Tools Inc.—This 16- ge power machine catalog cov- s selling features, dimensions, e rating capacities, ordering s cifications, dies available and



SHEEHAN metal belt conveyors
do the job right ... and better!

R. T. Sheehan Company plans, engineers . . . and designs the *right* conveyor to do the *job right* for your particular needs. They save time, unnecessary use of manpower . . . and give you greater floor space economy. SHEEHAN conveyors are *dependable* . . . and PRACTICALLY MAINTENANCE-FREE. Call us today to send one of our technical sales engineers to analyze your material handling problem.



FOR FORGING AND STAMPING PRESSES

- The Sheehan positive drive-end spike studded pulley—no belt slippage due to heat.
- 6½ inch under press clearance (belt to the floor).
- Easily converted to scrap handling.

Do the *job right*... the right conveyor is a *SHEEHAN*

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accessories for five pipe machines and power drives. Several models are described and shown in color, and sketches show adaptations.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Increment Motor

Wagner Electric Corp. — Features of the Wagner increment motor and starter combination, three-step or two-step, are outlined in a four-page brochure. The brochure is illustrated with application charts.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

EDITORIAL REPRINTS:

Hot Dip Galvanizing

Part I of a series covers the length of submersion in hot dip galvanizing. Research shows that beyond 5 minutes, there is a decided increase in tramp particles and formation of dross.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Roll STANDARDS or SPECIALS
with Hartford Special
AUTOMATIC
THREAD ROLLERS
⅛" to 2½" lengths
Boost production with economy and accuracy. Easy set-up, automatic feed, vibration-free operation and self lubrication featured in both models. Up to 150 pieces per minute, thread lengths from ⅛" to 2½", diameters from .086 through .250.
New Bulletin TR100 gives full details and specifications.
When it comes to production —
come to
HARTFORD
Special
for
• Automatic Thread Rollers • Super-Spacers
• Automatic Drilling & Tapping Machines
THE HARTFORD SPECIAL MACHINERY CO., HARTFORD 12, CONN.

Shell Molding

Design and economics of shell molding are covered in two recent STEEL articles. If castings can be made easily with a resultant machine shop saving, the method is advantageous. Savings help pay cost of initial expense. As for design, more production from less plant space is the promise of a mechanized foundry.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Sigma Welding

Here's a progress report of research, development and commercial exploitation of sigma welding as applied to carbon steel. To experts maintain that the inert gas-metallic arc process stands to move more rapidly into fields dominated by coated-electrode welding.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Plant Noise

Harry Chandler, STEEL Associate Editor, discusses plant noise in a recent article. Among other things, factory din can lead to hearing loss claims by employees and directly influences day-to-day production. Some effective means used to dampen sound are discussed.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

Dross Formation

K. S. Frazier, Detroit Steel Products, completes Part II of the hot dip galvanizing series. Proper control of dross formation, according to Mr. Frazier's article in STEEL, can lead to savings. Tin, temperature and cleanliness controls automatically improve uniformity and product quality.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Coil Handling

Motorized tongs simplify coil handling, says a recent article in STEEL. Lifting, carrying and safe delivery can be done with push-button ease. Here's Jones and Laughlin's experience with the method.

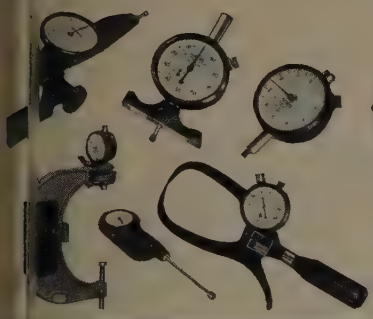
FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Deep Draws

This process does not lend itself to handbook science. J. Walter Gulliksen, Worcester Pressed Steel, covers the few basic principles in a STEEL article. Beyond these, he emphasizes, variables, such as corner radii and tolerances, enter the picture.

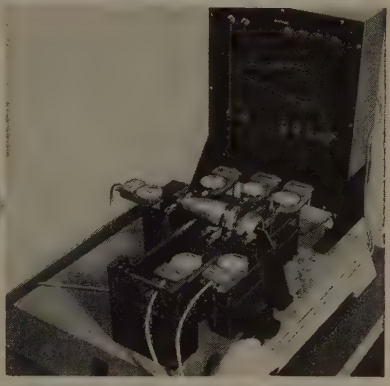
FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

FEDERAL has *Everything* in Gages for Dimensional Control



DIAL INDICATORS AND GAGES

Indicators — over 80 different models, ranges, sizes, graduations, styles — for every accuracy, space, and visibility requirement. Indicating Gages of all types including snap, hole, depth, caliper, etc., and special.



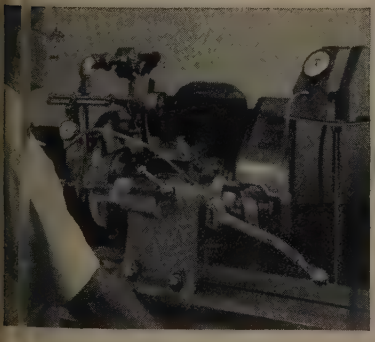
PICTURE PANEL GAGES

Multiple dimensions inspected simultaneously and quickly. (1) A single or individual light indicates at a glance if one or more dimensions are wrong. Or (2) separate lights identify incorrect dimensions and indicators show *how much.*

AIR GAGES

Federal Dimensionair: Greatest measuring range of any air gage — .003" with 2500 to 1 magnification. Most modern air gage. Available in various applications and combinations with Electrical and Electronic gages. *Send for new complete catalog.*

AUTOMATIC SORTING GAGES



Invaluable for selective assembly methods of production. Parts are measured and sorted into any number of dimensional categories with great accuracy and speed. 100% inspection without interfering with production schedules. Semi-automatic or hand fed.

MACHINE CONTROL GAGES

Grinding operations automatically and consistently size controlled—with exceptional accuracy. Also bare wire, insulated wire, glass tubing, steel rods, sheet, and similar continuous material is not only gaged in process but size-controlled by automatically adjusting the machine to compensate for variations out of tolerance.

ENGINEERING GAGE SERVICE

Call us in on the job when you start planning your gage requirements. We have helped many plants solve their gaging problems and we can help you too. Let us know your requirements. Federal Products Corporation, 4213 Eddy Street, Providence 1, Rhode Island.

Federal can process engineer, design, and build complete sets of gages for any production job: Can often save money for you by modifying *stock* gages. Consult Federal before you process your next job. Save time and money and get better gages.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES

Drill Unit

. . . hydraulically operated

The Drill Unit Division of Rockwell Mfg. reports a new modification of its standard air-hydraulic drill unit.

The modified unit, differing only slightly in design from the conventional type, can be operated entirely with hydraulic fluid. The chief advantage is greater thrust capacity in addition to increased adaptability. The thrust of the three standard units is increased from 1800 pounds when operated on air to 6500 pounds on an oil circuit at 300-psi oil pressure. Rockwell Mfg. Co.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

Surface Grinder

. . . has hand or mechanical feed

A precision surface grinder designed for gage and form tool work as well as surface grinding, is available with hand or mechanical feed. Its longitudinal tab travel is 20 inches, transver table travel, 7 inches and vertic travel of grinding wheel, 15 inche It will grind work 6 inches x inches x 15 inches high under

7-inch grinding wheel driven b any 1-hp motor driven spindle.

For close work the elevati and transverse movements ca be equipped with indicator gag for use with gage blocks or mea uring rods. Other attachmen such as hard chrome table way wet attachment, etc. are availab Covel Mfg. Co.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CA

Exhaust Blowers

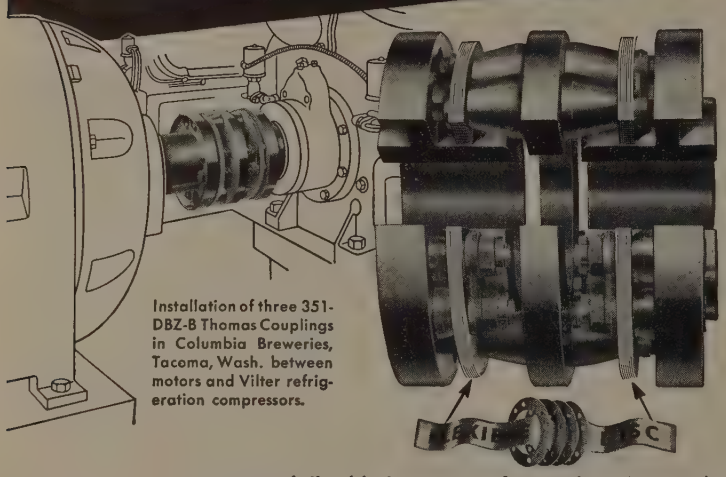
. . . for corrosion service

Heil announces the developme of two complete lines of exhau blowers protected for corrosi and abrasion service.

A compact, self-contained coat

exhaust fan set, designed for ser ice ranging simple ventila ing to handling of moderately co rosive atmospheres is available blower capacities from 300 to 70 cfm. A complete line of heav

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

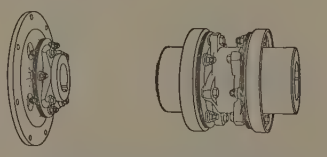


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

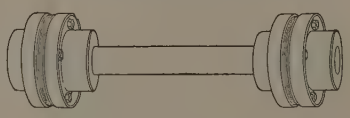
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.



Write for our new Engineering Catalog No. 51A

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THOMAS FLEXIBLE COUPLING COMPANY

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GEAR MANUFACTURERS

Exclusively

if you have trouble meeting production schedules.

if you have trouble meeting precision tolerance specifications.

YOU should "read-up" on the HAMILTON® line of Small-Gear, Precision Hobbing Machines!

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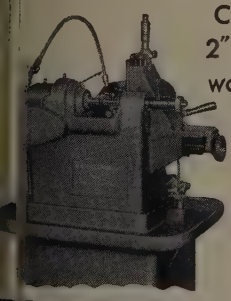
REE *PRECISION* MACHINES to meet your every requirement.

HAMILTON No. 00

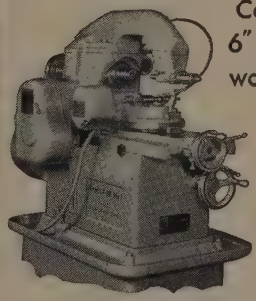
For the generation of spur gears and pinions only.



Capacity: 2" O.D. of workpiece.

HAMILTON No. 1

Hobs spur and spiral gears, worm gears and worms (to three thread), splined shafts, gear sectors, and pinions.



Capacity: 6" O.D. of workpiece.

HAMILTON No. 1-B

Generates any shape that can be made on the No. 00 or the No. 1 machines, *plus* bevel gears and face gears.

Capacity: 6" O.D. of workpiece (3" O.D. by 3/16" face, for bevel gears.)

Exclusive Greater range of hob spindle speeds: 109 to 1259 R.P.M. — 12 speeds.

Exclusive Speed, feed, indexing. *Each can be selected independently.* This, and wide range of hob speeds, adds flexibility; reduces set-up time; gives quick selection of speed and feed to suit material and gear size.

Exclusive Alignment and trueness of work and hob spindles are held to within .0002".

Exclusive Generates gears from 3 teeth to 1200 teeth.

Exclusive Accumulative error of not more than .0002"

THE COMPLETE STORY will be sent to you free for the asking. Request BULLETIN GH-5310 DO IT NOW!

THE *Hamilton* TOOL COMPANY

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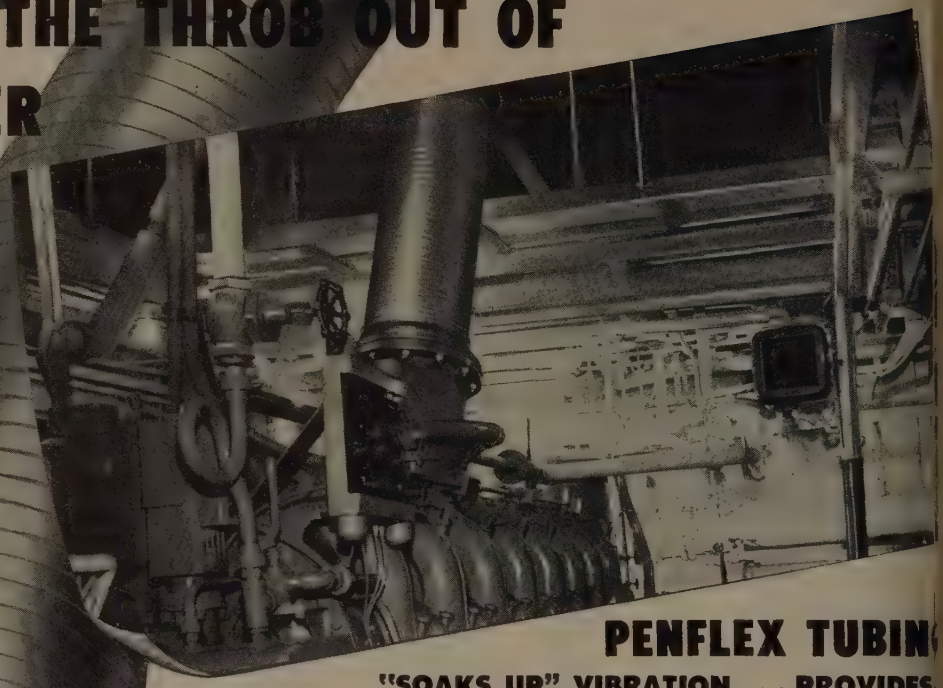
TAKES THE THROB OUT OF POWER



PENFLEX TUBIN

"SOAKS UP" VIBRATION . . . PROVIDES SMOOTHER COOLING OPERATION

WHEN A 16-cylinder, 1,750-hp diesel engine roars into action, the air-cooling and circulation piping really has to "take it." This particular installation performs perfectly because it is equipped with Penflex Flexible Metallic Tubing. A 5-foot length of air-jacketed 14" interlocked Penflex Tubing reaches from exhaust to stack. Its tough, rugged, "seep-proof" construction holds exhausts tight as a pipe . . . yet it is flexible enough to absorb the constant vibration.

In the power field you have many calls for Penflex—for air and gas lines, for transmission of oil, steam, and liquids. There is a complete line of steel, bronze, and aluminum Penflex Flexible Tubing, Hose and Couplings in sizes from 1/8" to 24" I.D.

Write today for new illustrated data book on "Flexineering"—the science of engineering flexible tubing to your specific job.

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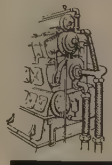
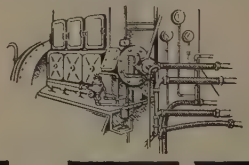




PENFLEX

HEART OF INDUSTRY'S LIFE LINE

d / rubber covered blowers for r ged service in severe corrosive o abrasive conditions has been m le available in blower capa- c s from 750 to 54,000 cfm. R ber protects the units from f es of rough minerals. Heil P cess Equipment Corp.

MORE DATA CIRCLE NO. 45 ON REPLY CARD

table Band Saw

. total weight: 16 pounds

. completely portable electric al-cutting band saw weighs only pounds. It is scarcely larger n a hand hack saw, and is c med by the manufacturer to be 1 times faster by actual test.

is said to be the only metal- c ing saw ever made that is fast

a l light enough to be used free- h d in any position. It has a s ck-cutting capacity up to 3¼ i hes by 4¼ inches. Equipped v h a powerful motor, its advan- t es include less operator fatigue a l a cleaner, more accurate cut. I xperienced workers can cut fer- r s and nonferrous metals, plas- t s and other problem materials v h speed and accuracy. Porter- ble Machine Co.

MORE DATA CIRCLE NO. 46 ON REPLY CARD

oduction Equipment

. replaces entire department

Peerless has designed a machine imed able to replace an entire partment.

This transfer machine processes rious differential carriers. It

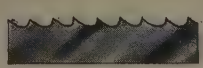
Strike up band saw profits..
...WITH ATKINS Silver Steel!®

Remember... IT'S THE BLADE THAT DOES THE CUTTING!

BUY ATKINS Silver Steel® Metal Cutting Bands AND GET:

- The *Right* Blade for Contour or Cut-Off Sawing
- The Finest Saw Steel for Longer Cutting Life
- The Correct Tooth for Fast, Free Cutting
- Lowest Maintenance Costs.

CONVENTIONAL TOOTH . . . for top performance in the toughest ferrous metals



CURLED CHIP BUTTRESS TOOTH . . . the original, Atkins Skip Tooth . . . for cutting all types of non-ferrous metals, plastics, fibre and wood

ATKINS Silver Steel SAWS

ATKINS

ENGINEERING B-W PRODUCTION

ATKINS SAW DIVISION · BORG-WARNER CORPORATION
INDIANAPOLIS 7, INDIANA

Beat Rising Production Costs

FOR YOUR PRESENT GRINDING JOBS

The new Pratt & Whitney Model "D" has everything it takes in construction and design to handle your present surface grinding jobs faster, more accurately. Easy to operate, easy to maintain, it will make every grinding man hour more productive.

OR TO REPLACE OTHER METHODS

As a simple cost analysis will prove, many planing, milling and other machining operations can be handled far more economically on a versatile P&W Model "D" Grinder. Here are important opportunities to save time, reduce costs and obtain closer tolerances and finer surface finishes.

COST-CUTTING FEATURES

- **CENTRALIZED CONTROL** . . . arranged for maximum convenience means extra operator efficiency with minimum fatigue.
- **HEAVY CONSTRUCTION** . . . Bed, Wheel Head and Spindle and Column are all built for added stability, heavy duty production and long life with minimum maintenance.
- **POWERFUL MOTOR** . . . to handle tough jobs faster. 30 hp regularly furnished; 40 hp optional.
- **IMMEDIATE PRODUCTION GRINDING WITHOUT WARM-UP** . . . and without loss of accuracy, reduces non-productive time.
- **HIGHER TABLE SPEEDS** . . . *from 2 to 100 fpm*, permit the use of much harder, longer lasting wheels. Wheel costs are greatly reduced, work speeded up. Wide range provides the *right* speed for practically any material.
- **PRECISION CONTROL for TABLE TRAVERSE** . . . Operation is through *twin* hydraulic cylinders with throttle control on the *return* side. This provides the same speed in either direction, prevents surge when speed is suddenly reduced, prevents creep in slow speed and eliminates coasting when stopped.
- **MEETS J.I.C. SPECIFICATION BOTH ELECTRICALLY AND HYDRAULICALLY!**

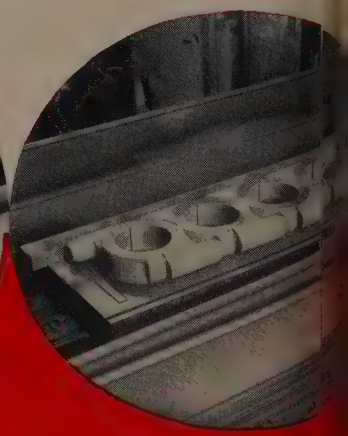
CARRIAGE STRAPS for JIG BORER

Cast Iron, 2½" x 23". 3 pieces per load. ⅛" stock removed. Grinding time only 8.4 minutes per load to produce precision flatness.

COUNTERWEIGHT CHAIN SHEAVES

Soft Steel, 2⅜" OD, 1" hole. 39 pieces per load, 1/32" stock removed. Grinding time per load only 3.4 minutes.

CONTROL BOX SUPPORT CLA



Cast Iron, 4½" ID, 5¾" OD, 9 pie
⅛" stock removed per side. Grind
5.6 minutes.

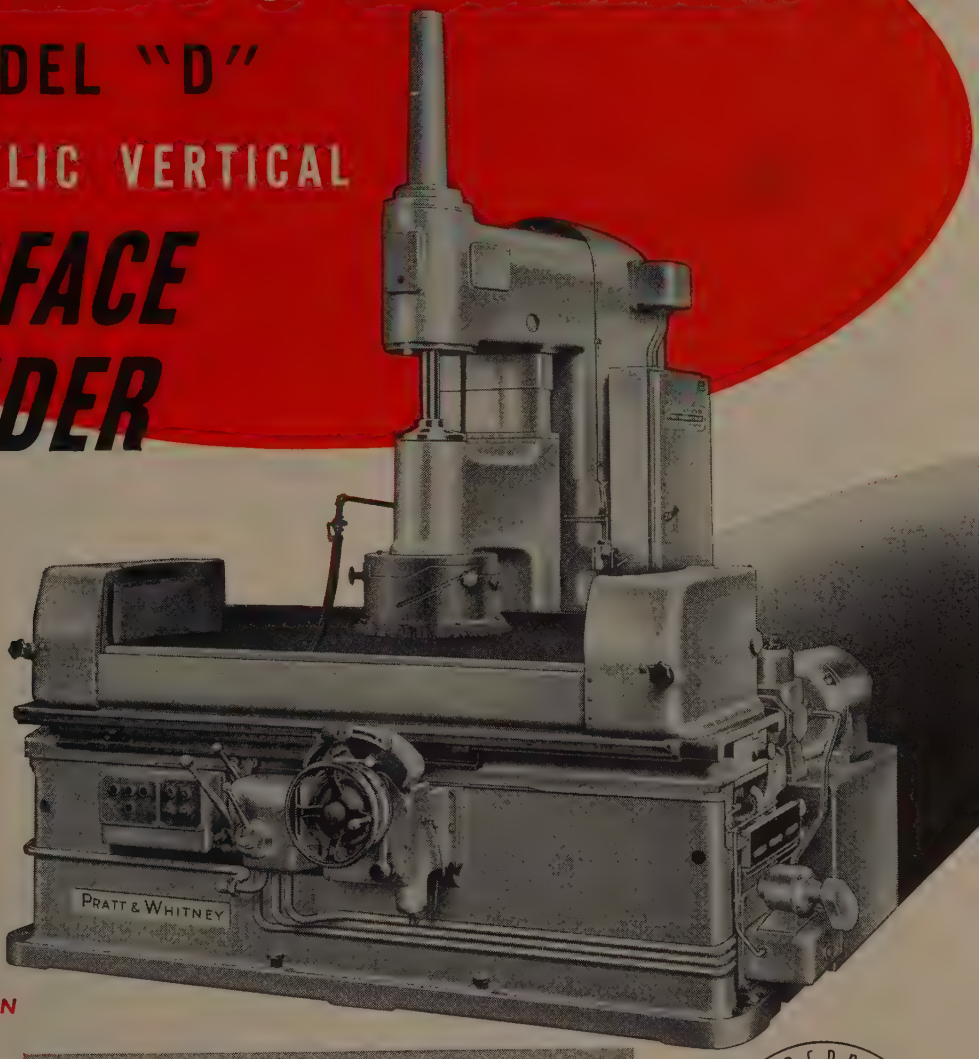
MODERNIZE with the NEW

PRATT & WHITNEY

MODEL "D"

HYDRAULIC VERTICAL

SURFACE GRINDER



HEEL DIAMETER

" Ring Wheel or

" Segmental Wheel

ABLE
ORKING SURFACE

" x 36" or

" x 60"

ND NOW FOR
OMPLETE INFORMATION

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n help **you** beat rising pro-
ction costs. Write on your
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e copy of Circular No. 369.

PRATT & WHITNEY
DIVISION NILES-BEMENT-POND COMPANY
WEST HARTFORD 1, CONNECTICUT, U.S.A.

SINCE 1860

First Choice for Accuracy

MODERNIZE with PRATT & WHITNEY REPLACE FOR PROFIT

ANCH OFFICES BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DALLAS (The Stanco Co.) • DETROIT • HOUSTON (The Stanco Co.) •
S ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT. . . . WEST HARTFORD

ALLINE TOOLS • CUTTING TOOLS • GAGES

Weld it once and done

no cracks, no porosity

Lightweight, tough, high tensile steels have made it possible for truckers to haul heavier loads with less dead weight—a decided economy.

No less important in saving time and money is the use of low hydrogen electrodes to weld these steels. When you weld low alloy high tensile steels—whether your requirements are tough or easy—Arcos Low Hydrogen Electrodes will consistently produce sound welds . . . welds that are free of cracks or porosity. There is no reworking of such welds—no chipping or re-welding to add more time to the job. The ability of Arcos weld metal to stand up in tough service—such as the strain on truck bodies of heavy loads or the impact of sudden stops and starts—is the result of high standard quality controls in the manufacture of Arcos electrodes.

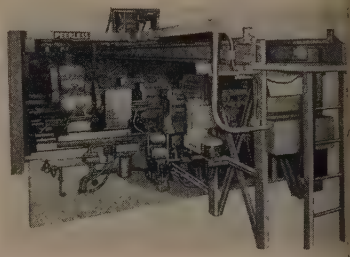
Send for the free Arcos booklet, "The ABC's of Welding High Tensile Steels". Arcos Corp., 1500 South 50th Street, Philadelphia 43, Penna.

ARCOS GRADE	A. W. S. SPEC.
Tensilend 70	E7016
Tensilend 100	E10016
Tensilend 120	E12015
Manganend 1M	E9015
Manganend 2M	E10015
Nickend 2	E8015
Chromend 1M	E8015
Chromend 2M	E9015

WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

takes the raw cast carriers, rough and finishes them and then com pletes rough-finished boring an facing operations, as well as drill ing and tapping, still holding pre cision boring and facing tolerance It processes 40 heavy truck-axl



carriers per hour, has 8 station with 5 working, 1 load and unloa and 2 idle. A hydraulically-actu ated transfer mechanism for pall movement is utilized. Power-op erated overhead pallet-return con veyor and elevator is another fea ture. Peerless Production Co.

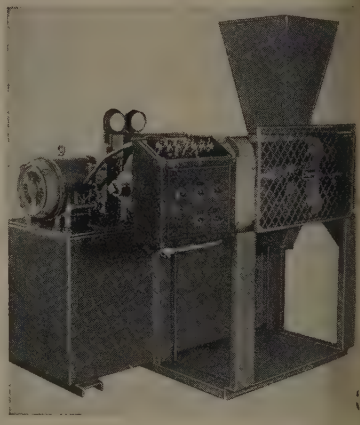
FOR MORE DATA CIRCLE NO. 47 ON REPLY CAR

Preforming Machine

. . . hydraulic, for plastic

A hydraulic preforming machin has been designed for the plast industry.

An electronic automatic contr system, using plug-in type relay



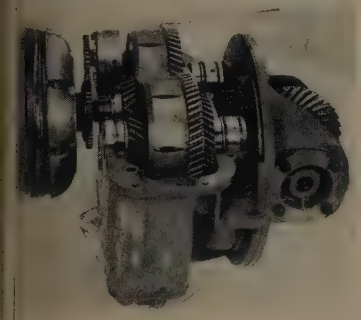
and long-life cold cathode tube governs piston movements t 1/25th of a second. Hydrauli pressures can be dial set, and pre former operates on full automati basis. Selective pressure range i 0 to 125 tons on the die which ma have single or multiple cavities It preforms parts to 25 sq in. i

a and 1¾ inches thick and ghing as much as 1¾ pounds. rizontal design permits gravity ding of preform materials and vity discharge of preforms. eration is practically dust free. ving parts and control panel fully enclosed. Hydraulic Di- ion, Logan Engineering Co.
MORE DATA CIRCLE NO. 48 ON REPLY CARD

dratork Drive

. does away with gear shift

A transmission which does away h the need for a gear shift, h and low gears and a clutch d clutch pedal is available for



s-powered Carloader-model for ucks in 3000-5000 pound capa- ies.

Hydratork drive combines a rque converter with a simple nstant-mesh transmission, mak- g it possible to operate a gas- wered fork-truck with three mple controls: An accelerator, brake pedal, a forward-reverse lector lever located on the steer- g column. According to the com- ny, the drive eliminates gear ashing in engagement, means noother acceleration, more posi- ve drive control at all times, less iver fatigue and controlled inch- g ability. Clark Equipment Co.
R MORE DATA CIRCLE NO. 49 ON REPLY CARD

When you want to ***lick corrosion*** *for longer equipment life*

Getting good corrosion resistance starts with a base metal of desirable characteristics. However, maximum equipment life can be assured only when the welds possess the same corrosion resistance as the base metal.

ARCOS STAINLESS ELECTRODES are designed to deliver the results you need on *all* your welding jobs. Regardless of the requirements, there's a wide selection to provide the best suited electrode for every application. Because each is backed by Arcos quality controls, you have complete assurance of physically, chemically, and metallurgically sound weld metal. That means longer-lasting welds . . . less time and fewer dollars for maintenance. Write for your free copy of "What Electrode Would You Use?"

Arcos Corporation, 1500 South 50th St.
Philadelphia 43, Pennsylvania

WELD WITH ARCOS STAINLESS ELECTRODES

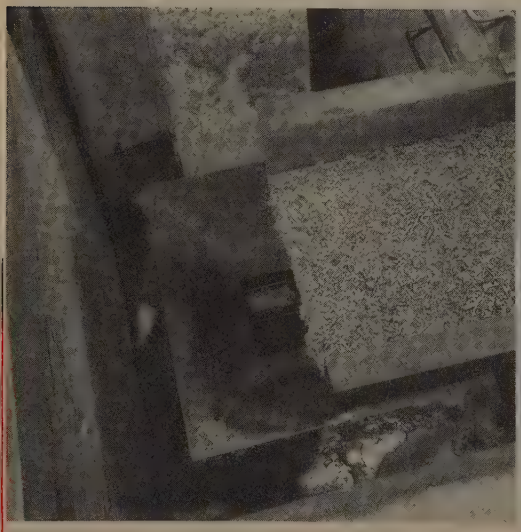
Chips from 381 automatic screw machines are conveyed in five parallel trenches 300 feet long. Removing floor plates shows a trench where twin conveyors handle alloy and carbon chips. Chute pivots to feed chips into either of the conveyors

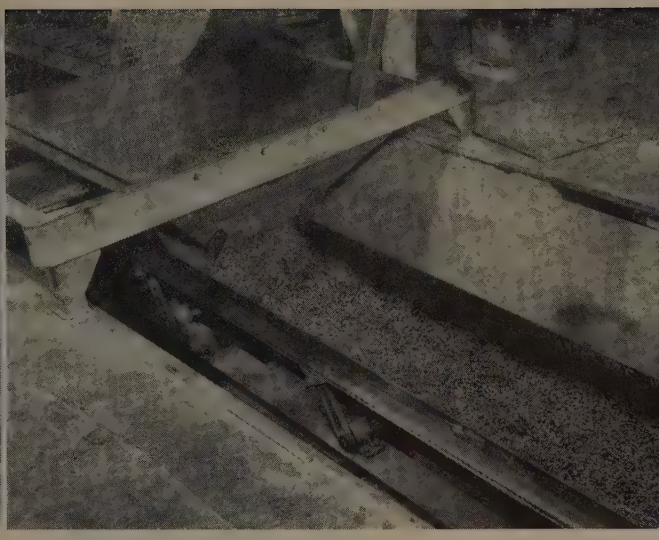
Conveyorized Disposal . . . TWIN SYSTEM

A 3500-foot oscillating conveyor system, serving 381 screw machines, segregates carbon and alloy chips, moves them continuously through oil cleaning into gondolas

At this point, chips drop from torsion-mount conveyor into a chute which leads to a continuous bucket elevator. Latter elevates chips and discharges to gondola cars

Chips are discharged through chutes to railroad cars fro two continuous bucket elevators. Link-Belt drum-type o pull in left foreground is employed here to spot the ca





When chips reach this point via the conveyors, operator ...es segregated grades into baskets for centrifuging. ...-4 to 8 gallons per basket—is removed and reused

After oil removal, baskets of chips are lifted by monorail from extractors and emptied into a torsion-mount conveyor which progresses the load to a bucket elevator

...ORTS CHIP GRADES

...FECTIVE METHOD for han...ng metal chips means highest ...rket value on the reclaimed prod... at St. Louis ordnance plant's ...e division. Contractor-operator ... McQuay-Norris Mfg. Co.

...A system of 48 Link-Belt Flex...unt oscillating conveyors, two ... positive-action torsion-mount ...illating conveyors and two ...cket elevators carry two chip ...oes separately from 381 screw ...achines. Chips go first to centri...ges which reclaim the oil, then ...oceed directly to gondola cars.

Dual System Throughout—Con...yors are arranged in a dual sys...n throughout. High alloy tung...en steel and carbon steel chips are ...ndled simultaneously from any ... the machines and kept separate ...om beginning to end. The dual ...stem makes it possible to reclaim ...d sell both chip types at their ...ghest market value.

Entire chip output from all ma...ines can be handled by either ...lf of the dual system in case all ...achines are processing the same ...pe of steel.

The 48 Flexmount conveyors and ...o torsion-mount conveyors add ... to more that 3500 feet in total length. These oscillating conveyors prove very adaptable to chip conveying. They can handle large or jagged pieces of metal and even rags, in addition to the chips. They are practically self cleaning and maintenance is low.

Five Parallel Trenches — The automatic screw machines are in one large area. Beneath the floor are five parallel trenches, more than 300 feet long. In each are located two lines of 12-inch-wide conveyors, mounted side by side. Chips are carried from screw machines by built-in chain conveyors to swivel-mounted chutes. The chutes can be adjusted to permit chips to fall into proper conveyor in the trench.

Each of the ten conveyor lines in the trenches requires four conveyor sections. These conveyors empty into two collecting conveyor lines, 18 inches wide, operating at right angles to the trench conveyors. Collecting conveyors, located close to the ceiling of a lower floor beyond the screw machine department, rest upon rigid steel supports. Each collecting conveyor line is about 175 feet long and consists of four sections.

Chips flow to a central two-departmental surge hopper, 95-cu ft in total volume, then are fed through lever-operated slide gates.

Oil Reclamation—From the hopper, chips are emptied into metal baskets and placed in one of four centrifuges so cutting oil can be extracted and reclaimed. This is an important cost reduction aspect since about 99 per cent of the oil is extracted, with 4 to 8 gallons being reclaimed from each basket of chips.

This oil is settled, filtered, pasteurized, then reused. Extracting the oil also puts the chips in a more marketable condition. Baskets of chips are lifted from the centrifuges by a Monorail hoist and emptied into one of two torsion-mount oscillating conveyors—24 inches wide, 55 feet long.

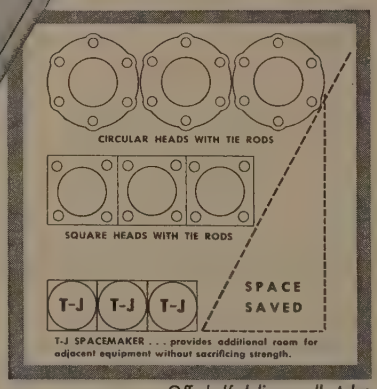
Directly Into Cars—These conveyors discharge directly into continuous bucket elevators which elevate the chips and spout them directly into open railroad cars.

Elevator buckets are arranged continuously and loaded by direct feeding. As the buckets discharge, material flows over the preceding bucket to the discharge point.

✓SAVE UP TO 40% SPACE!

✓EXTRA HIGH SAFETY FACTOR!

✓DEPENDABILITY . . . backed by 38 Years of Know-How!


CIRCULAR HEADS WITH TIE RODS
SQUARE HEADS WITH TIE RODS
T-J
T-J
T-J
SPACE SAVED
T-J SPACEMAKER . . . provides additional room for adjacent equipment without sacrificing strength.

Off shelf delivery all styles to 3" bore in increments of 1" to 12" stroke.

NEW (T-J)

Spacemaker

AIR CYLINDERS

Streamlined design of the new T-J Spacemaker *eliminates tie rods . . . saves up to 40% in mounting space!* It's performance-proved . . . *super rugged* with extra high safety factor . . . solid steel heads . . . heavy wall, precision honed, *hard chrome plated,* seamless steel body . . . leakproof cylinder head to body construction . . . heavy duty, hi-tensile, *hard chrome plated* piston rod.

Available with the new T-J Super Cushion Flexible Seals which insure positive cushion with automatic valve action for fast return stroke. Many standard sizes and styles . . . for pushing, pulling, lifting, clamping or control jobs. T-J dependability. Write for bulletin 454. The Tomkins-Johnson Co., Jackson, Mich.

(T-J) TOMKINS-JOHNSON

RIVETORS . . . AIR AND HYDRAULIC CYLINDERS . . . CUTTERS . . . CLINCHORS

Press for Large Carbides

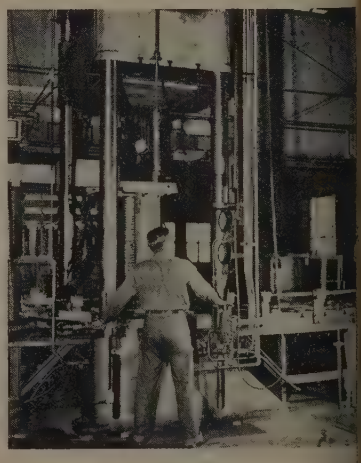
A NEW 220-ton hot press, capable of producing pieces of cemented carbide as heavy as 4000 pounds has been installed in the Detroit plant of G-E's Carboloy Department.

The press will produce parts for large die sections, rolls for rolling steel strip, large punches for cold extrusion work, large wear-resistant linings for brick molds and many other uses.

The 19-foot hydraulic unit will compress huge pieces of carbide ranging in size from about 21 inches in diameter by 21 inches high, to 7 inches in diameter by 5 feet high, the dimensions of the piece being determined by weight. Although larger sized pieces can be processed, the present limiting factor is the size of molds

In Production—Already in limited production, the huge press cuts hot press processing time by a reported 50 per cent under the method used for smaller pieces. It is also capable of handling smaller pressings, such as conventional draw dies, capstan rings for wire, Hevimet counterweights and blanking dies at even less heating and pressing time.

Work is brought under the ram of the hot press by a traversing table that also doubles as a loading platform. The work itself, during the pressing phase, is heated by a heating furnace of a size suitable for the mold positioned in the press. Heating temperatures range from 1300 to 1500°C.



PRODUCING CEMENTED CARBIDE . . . *processing time cut 50 per cent*

SOLAR'S

SURE-SPEC STEELS

steel for any part
you make for any product
anytime at minimum cost!

Solar is proud to furnish some of the steel for this leading line of Fully Automatic Clothes Washers and matching Clothes Dryers. Turn the ad upside down for the manufacturer's name— General Electric

"for service dependable as the sun"

SOLAR STEEL CORPORATION

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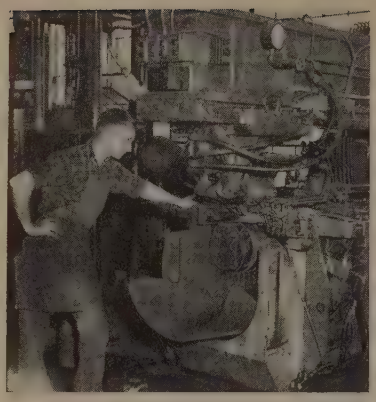
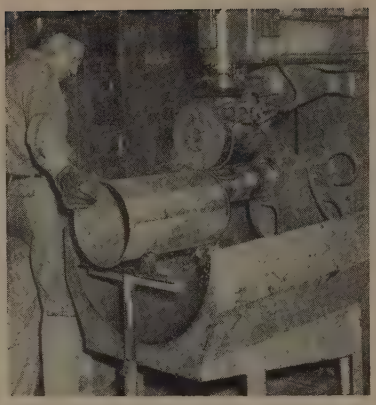
HOT ROLLED AND BAR AND TUBE STOCKS AND PROCESSING SERVICES FROM 11 PLANTS

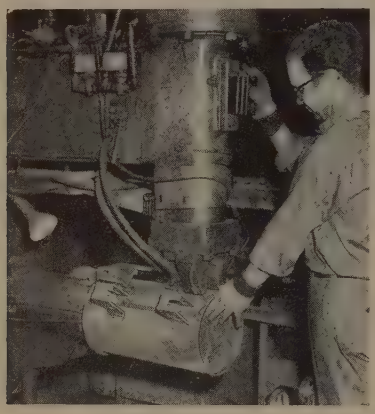
Engineered System Fills Bill for Fabricators



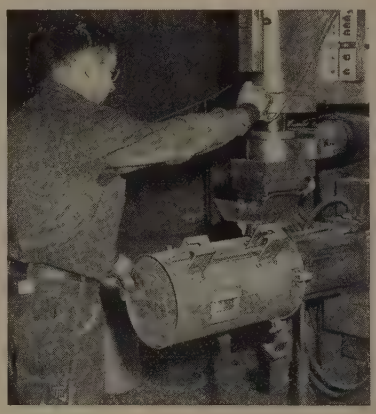
Shaped steel is joined with oil-tight mash seam weld on this 300-kva machine, equipped with two automatic heat controls for regulating heat first at start of weld, then after first inch



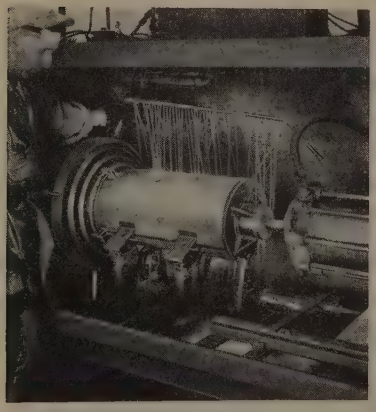
Bottom is welded to the tank with an oil-tight circular seam on a 125-kva welder. Mash seam weld on side and lap seam weld on bottom of the cylinder require no further finishing work

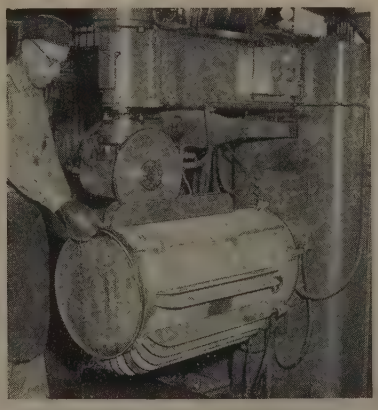


Tank is not removed while upper and lower mounting brackets, name plate bracket, low voltage neutral ground stud, tank grounding and lightning arrester studs are projection welded



Next stage fixes two combination cover clamps and lifting hooks, plus two cover clamps, to top of each tank. This projection welder also attaches inserts for mounting core and coil





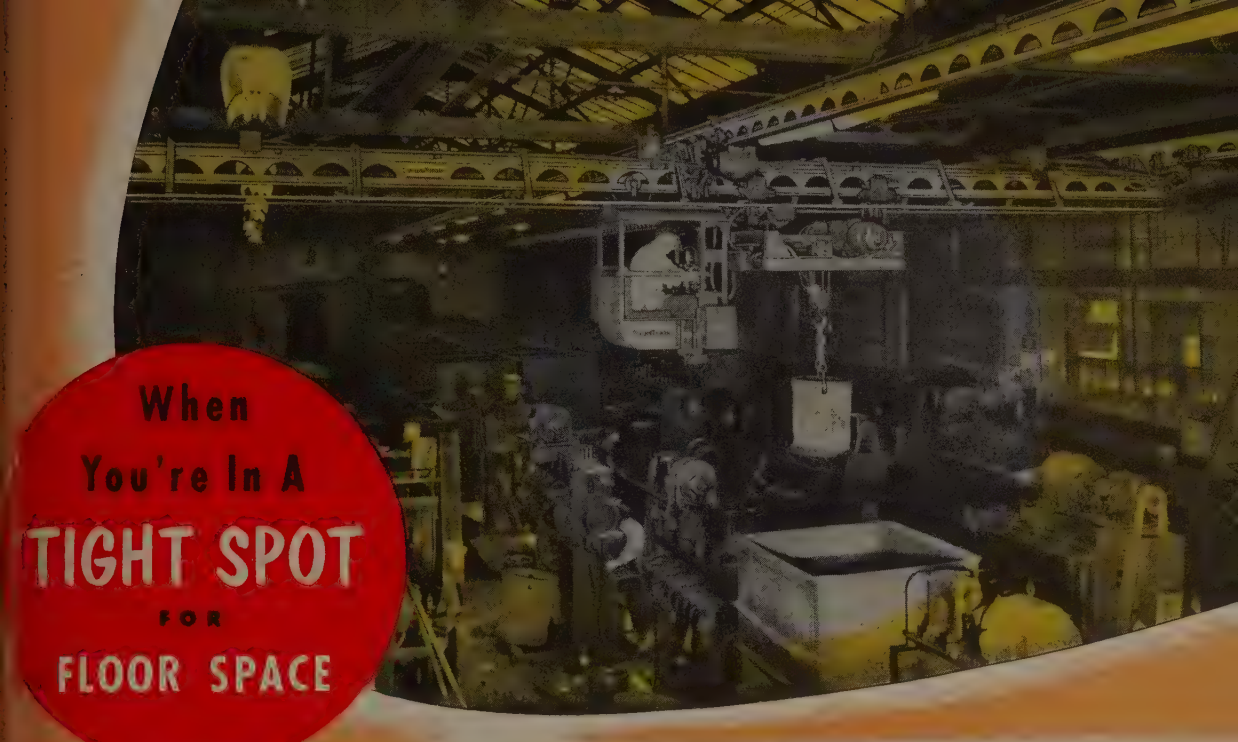
Completed tanks are pressure leak tested in setup above, left. Finally, cooling fins are seam welded to the shell on this 200-kva longitudinal machine. Fins are U-shaped channels; thus each pair of fins requires only seam weld

FABRICATION process used t turn out distribution transforme tanks provides an excellent case t point up the production potentia of a thoroughly engineered resist ance welding operation.

Moloney Electric Co. uses si welders to produce as many as 59 transformer tanks in an 8-hou shift. The tanks are 3 to 100-kv capacity, fabricated from 12 an 14-gage rust-resistant copper bear ing steel. They range in size fron 10 to 30 inches in diameter, are 2 to 54 inches high.

Moloney says the six machines— all Sciaky three-phase welders — have performed two years withou mentionable downtime. And th test of successful operation is strin gent. All tank joints must be per fectly pressure tight, because th completed transformer is sealed i an air-evacuated oil-filled tank.

Side seam of the cylindrical tan is joined with one longitudina mash seam weld. Tank bottom joined to the cylinder with a la seam weld. The cover clamps an lifting devices are projection welc ed and all other hardware and fi tings—inside and out — are als projection welded.



When You're In A TIGHT SPOT FOR FLOOR SPACE

...it's time to find out how ECONOMICALLY you can move materials THE CEILING WAY

CRAMPED for floor space? Wondering how to squeeze in another machine? Feeling the need of a plant addition?

Then consider the possibilities of creating space in your present building through use of Cleveland Tramrail overhead materials handling equipment.

Often large floor area savings can be made—from 20% to 50% is not unusual. Thus, you might be jammed up in a 10,000 sq. ft. building but by installing Cleveland Tramrail equipment wind up with 2,000 to 5,000 sq. ft. to spare.

Unbelievable! Miraculous! May sound so. Yet that has been accomplished many, many times. And the reason is simple. Tramrail eliminates need of wide aisleways, permits high piling, provides fast overhead deliveries. In addition, there are other advantages.

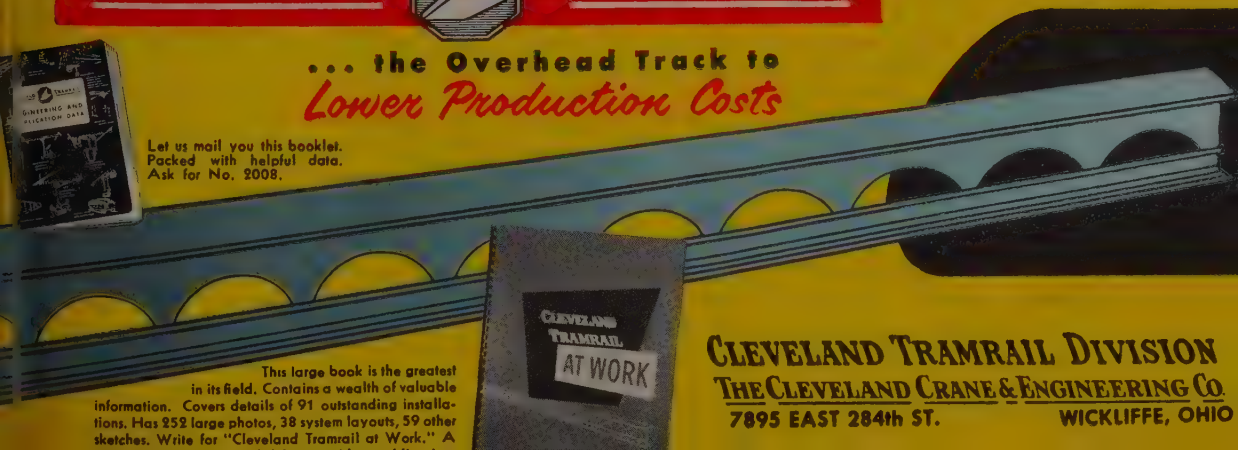
Have a Tramrail representative give you the full story of this space-saving, profit-building equipment.

Investigate the Possibilities of

CLEVELAND TRAMRAIL

... the Overhead Track to *Lower Production Costs*

Let us mail you this booklet. Packed with helpful data. Ask for No. 2008.



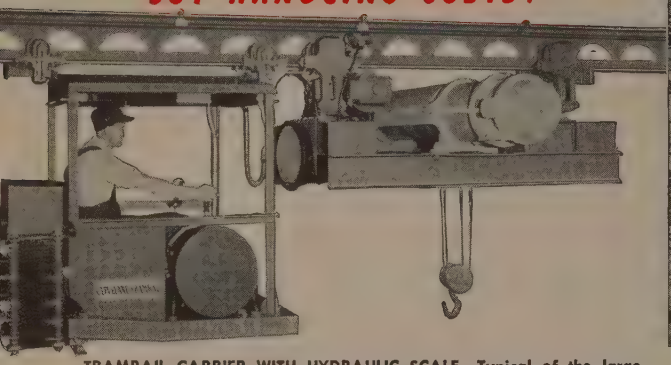
This large book is the greatest in its field. Contains a wealth of valuable information. Covers details of 91 outstanding installations. Has 252 large photos, 38 system layouts, 59 other sketches. Write for "Cleveland Tramrail at Work." A

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7895 EAST 284th ST. WICKLIFFE, OHIO

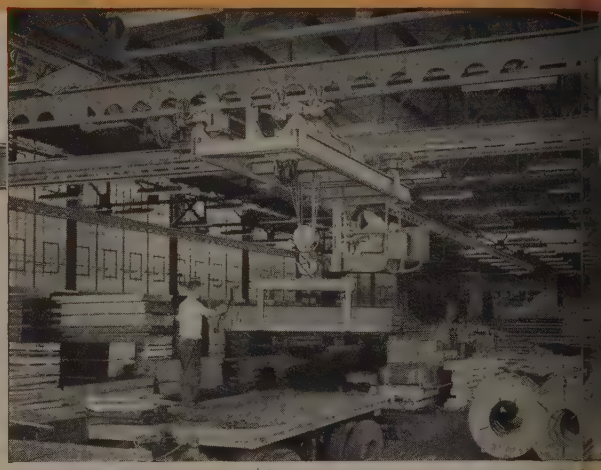
Did You Ever Consider the Fact That the Installation of a CLEVELAND TRAMRAIL SYSTEM will *Turn Handling Losses into Substantial Savings?*

ALL time spent handling materials is *lost time.* It adds no value to the products. Nationally, about 25% of all production time is consumed in materials handling. Any reduction in this brings about a substantial saving. Cleveland Tramrail equipment has fully proven itself as an outstanding method for cutting fruitless handling costs.

Here's Proof THAT OVERHEAD HANDLING METHODS CUT HANDLING COSTS!



TRAMRAIL CARRIER WITH HYDRAULIC SCALE—Typical of the large variety of Cleveland Tramrail units designed for a multitude of applications and conditions is this cab-operated traveling carrier equipped with a hydraulic scale that weighs all loads handled, quickly and easily.



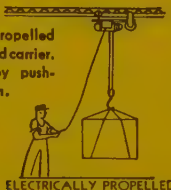
CUTS HANDLING COSTS 66⅔%—BOOSTS SHEAR PRODUCTION 40% — This 5-ton, 48-foot crane handles 150 tons of incoming steel daily with one-third of the man-hours formerly required. By keeping six shears supplied with steel it has increased production by 40%.

There is a CLEVELAND TRAMRAIL CARRIER Best Suited to Your Needs!

Hand-propelled carrier. Easy operating. Guaranteed starting effort only 15 lbs. and running effort 10 lbs. per ton weight.

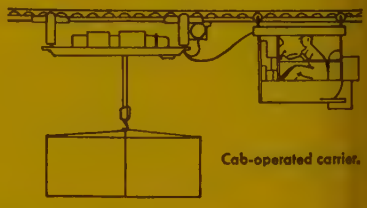
HAND PROPELLED

Electrically propelled floor-operated carrier. Controlled by push-button station.



ELECTRICALLY PROPELLED

CLEVELAND TRAMRAIL carriers embody engineering principles which insure proper performance of each unit and successful operation of an entire Tramrail system. Long-wheelbase carriers prevent hopping or jumping. Swivel wheel yokes provide flexibility and prevent wheel flanges digging into sides of track. Wide flat treads make large area of contact with flat Tramrail runway rail, resulting in smooth, easy operation and long life.



Cab-operated carrier.

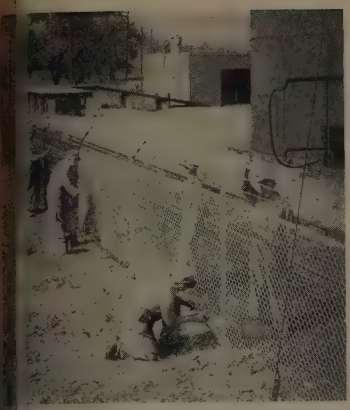
Carriers for nearly every handling need are available: Hand-propelled; motor-driven; floor-controlled; platform controlled; cab-operated.

For Dependable Advice

Consult Your CLEVELAND TRAMRAIL Distributor

Cleveland Tramrail's great nation-wide sales organization is composed of experienced engineers who know industry and its handling problems —and how to solve them. Their chief concern is to provide the most satisfactory method, whether it be by overhead Tramrail or some other means. They are careful to avoid misapplication. You can depend on the advice of your Cleveland Tramrail distributor.

CLEVELAND TRAMRAIL DIVISION The CLEVELAND CRANE & ENGINEERING CO., Wickliffe, Ohio



ating Problem Solved

n the how-to-do-it angle and the get viewpoint, coating wire fence long been a problem. Rust-Oleum o. found that special lambs-wool ers, saturated with material, ap- d to area, result in: 99 per cent of erial going on fence, not ground; east 70 per cent of other side of e being coated at the same time

nched Card Transmission

NCHED card transmitter that ks over regular telephone cir- ts at the rate of almost 1000 abetic or numeric characters a ute is announced by Interna- al Business Machines Corp., En- ott, N. Y.

Capable also of checking the ac- acy of its rapid-fire conversation listening in on them, the new elopment insures exact, fast du- ation of punched card data be- en points thousands of miles rt

Existing Networks Used—Utiliz- telephone and telegraph net- ks to link these new card trans- ting and receiving units, the chine makes possible swift trans- ssion of accounting data from entralized branch office and nt locations to any central point h as a company headquarters. Transceiver is also used for nsmitting and receiving on a y-automatic basis.

How It Works—When informa- n is to be sent to a distant point, Transceiver reads the data re- ded on IBM cards in the form punched holes. As cards are d, electronic circuits generate led impulses in the form of ps, each series of sounds repre- ting a hole in the card. The

Harden Piston Rings with HEVI DUTY BOX FURNACES

U.S. Hammered Piston Ring Company of Stirling, New Jersey, manufacturers of aviation piston rings, found that very close tolerances could be met when hardening their rings in Hevi Duty Furnaces.

These furnaces operating 24 hours a day treat thousands of rings in size from 1 to 33 inches in diameter. Leo Maren, Plant Superintendent, says, "I have used Hevi Duty Furnaces for over 20 years. I like the even heat and uniform temperatures afforded by the heating elements located on the six sides of the work chamber."
Learn more about the many features that are designed into Hevi Duty Box Furnaces.

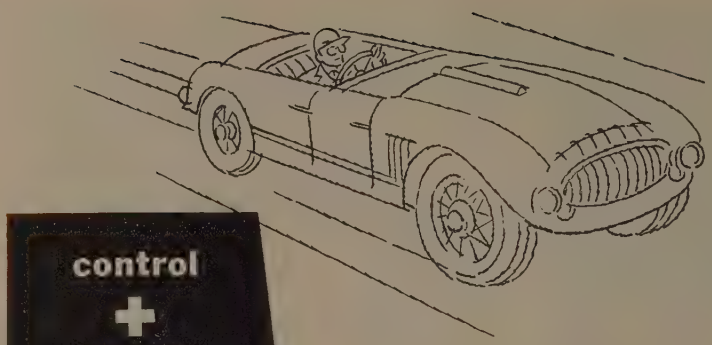
Write for Bulletin 441.

HEVI DUTY®

HEVI DUTY ELECTRIC COMPANY

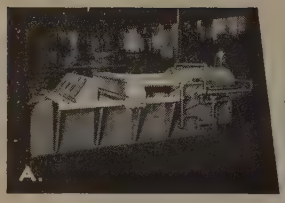
MILWAUKEE 1, WISCONSIN

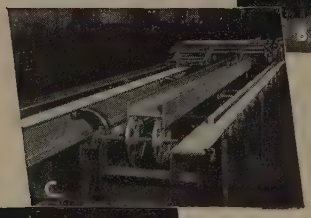
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers *Constant Current Regulators*



control + speed

Hand-crafted sports cars are precision-built to hug the curves — take any road conditions — to provide the ultimate in control, speed and safety. Like these prima-donnas of the highways, BEATTY machines are constructed on precise tolerances to afford the same kind of exact control, speed and safety in industrial metal fabricating. One of the machines illustrated can be modified to suit your particular problem. Or, let our engineers recommend, design and build one to your exact requirements.





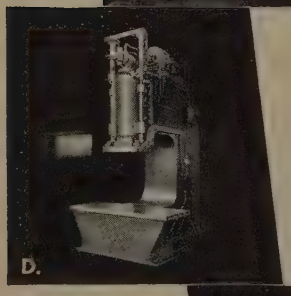
A. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

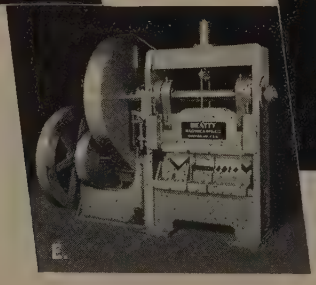
B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

C. BEATTY Spacing Table handles web and flange punching without roll adjustment.

D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

E. BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.





BEATTY
MACHINE & MFG. CO.
HAMMOND, INDIANA

sound signals actuate the punching mechanism in the distant receiver which simultaneously creates exact duplicates of the cards being transmitted.

The newly-created punched cards then become immediately available for accounting machine and computing processing. The company says the Transceiver has been tested between Air Force installations with a high degree of success. One aircraft manufacturer is also testing the device between one of its laboratories and its electronic computing bureau.

Continuous Rocker Arm Cycle

A model 221 Bore-Matic machine is designed with four individual fixtures and loading mechanisms. Mounted on a fixture subbase on the machine table, it operates in a continuous cycle.

Fixture is designed by Heald Machine Co., Worcester, Mass., to allow operator to load four stations during boring operations on previously loaded parts. This eliminates an increase in cycle time for loading operations. Following the boring operation, tools are automatically retracted and the table runs out at rapid traverse. Work is automatically unclamped and ejected onto a conveyor.

Rocker arms are malleable iron with Rockwell 16-23. Stock removal is 0.015-inch on diameter. Boring heads run at 1750 rpm with a boring lead of 0.004-inch. Net production at 75 per cent efficiency is over 600 pieces per hour.

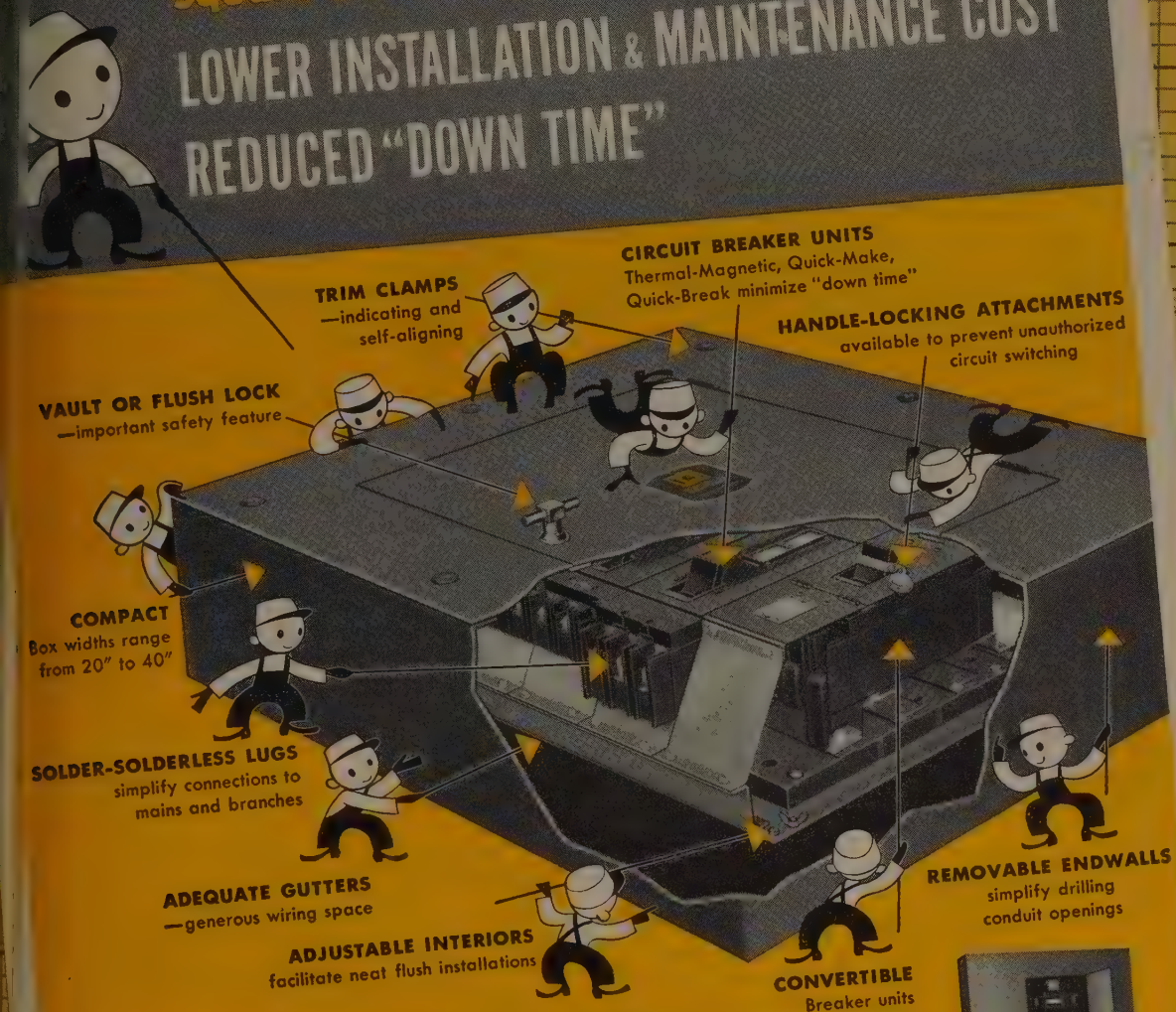
Gage Checks 13 Dimensions

A gage that inspects 13 dimensions simultaneously on a rear planetary carrier assembly has been developed by Sheffield Corp., Dayton, Ohio. The gage indicates by means of colored electric lights whether or not the 13 dimensions are within tolerance, oversize or undersize. Parts at the rate of 600 to 800 per hour at 100 per cent efficiency can be inspected.

Dimensions checked include two locations on four outside diameters, the inside depth at four places and outside height of the base. The instrument is set up with maximum and minimum masters.

Square D ML Panelboards give you . . .

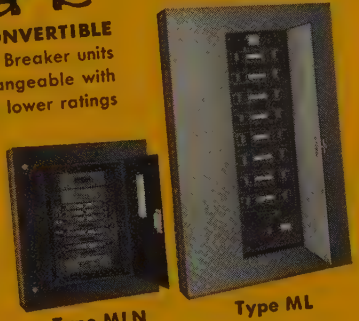
LOWER INSTALLATION & MAINTENANCE COST
REDUCED "DOWN TIME"



SQUARE D's TYPE ML CIRCUIT BREAKER DISTRIBUTION PANELBOARDS

provide complete, 2-way protection through the use of thermal-magnetic breaker units. Costly "down time" is held to a minimum since circuit breakers can be reset quickly after the fault has been cleared.

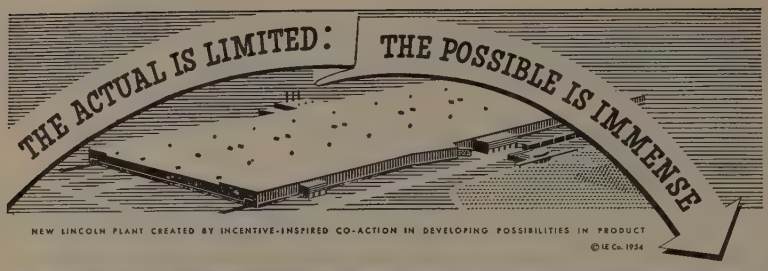
Four circuit breaker frame sizes provide ratings ranging from 15 to 600 amperes, 250 or 600 volts.



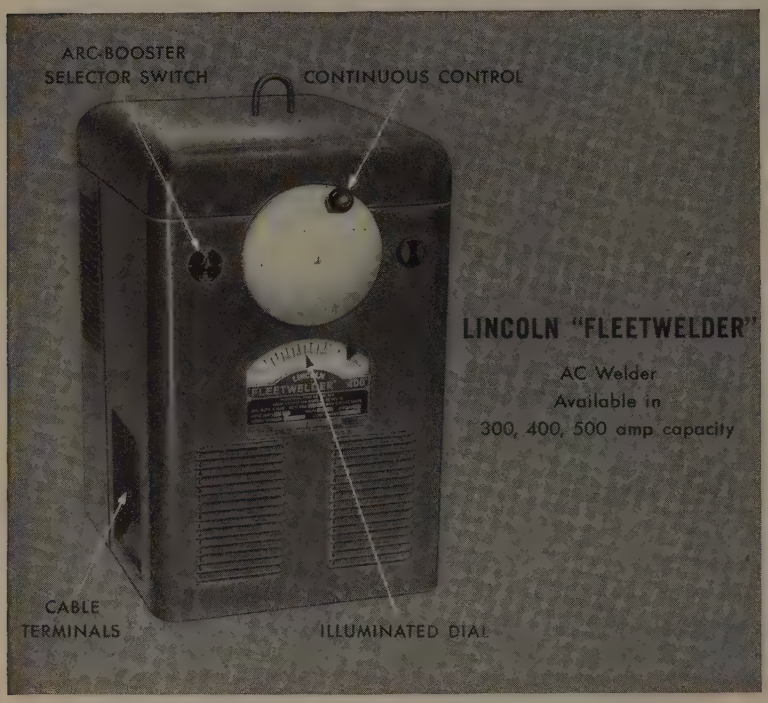
Type MLN Type ML

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY


THE ACTUAL IS LIMITED: THE POSSIBLE IS IMMENSE
NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT
© LE Co. 1954

AC WELDING MADE SIMPLER



• **Easy Current Selection.** A few turn of "Fleetwelder's" dial-operated Cor tinuous Control select any current fror a wide welding range. The exact welc ing current is indicated on an illum nated dial that also shows whether th machine is turned on or off.

• **Current Stays Set.** Rugged holdin devices maintain accurate current se tings. There are no sliding mechanism or moving coils to become loose as th arc is struck.

• **Safe to Operate.** "Fleetwelder's open circuit voltage is held to 71 vol for safety. Where specified, open circu voltage can be limited to 24 volts by a optional safety contactor.

• **Arc is Self-Starting.** There is n more electrode sticking to slow u welding operations as on convention AC machines when lighter currents ar smaller electrodes are used. "Flee welder's" Arc-Booster starts the a instantly each time the electrode touch the work.

• **Quality Comes Easier.** Lincoln hot-start arc prevents cold overlaps . insures instant penetration at the sta of every weld, an advantage for tack plug welding.

ONLY FLEETWELDER'S HIGHER USEABLE CURRENT REALLY CUTS AC WELDING COSTS

It's so . . . By taking advantage of Lincoln's higher useable currents, you can now weld faster . . . use larger diameter electrodes to cut AC welding costs 10% and more. That is why the "Fleetwelder" starts saving money on your very first job . . . and for these reasons:

1. Higher Useable Current There are more *reserve* amps . . . up to 50% added current . . . in the "Fleetwelder" to put to work on your welding jobs. As a result, you get more amps per dollar with Lincoln than with any other welder.

2. Complete Overload Protection It is safe to operate at "Fleetwelder's" additional current because of built-in thermostats that cut out the magnetic starter . . . eliminating all danger of burn-out . . . *a feature found only in Lincoln.*

"Fleetwelder" Pays for Itself. Labor and overhead savings through "Fleetwelder's" faster operation return your investment in surprisingly short period. Have your Lincoln representative show you how. Write

SEND FOR BULLETIN

Complete description and specifications on "Fleetwelder" are in Bulletin 1314, available by writing on your letterhead.

THE LINCOLN ELECTRIC COMPANY

Dept. 1602

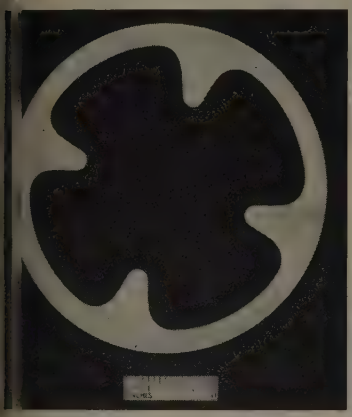
CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

ternal Fin Extrusion

OTHER of the types of prod- made possible by extrusion is ing with special shapes. De- n engineers associated with blems of heat transfer are par- ularly interested in tubing with egral fins on the inside surface. h tubing has been produced by Tubular Products Division, ocock & Wilcox Co.

Surface area is one of the most portant factors in heat trans- . With fins on the inside or



EXTRUDED HEAT TUBES
. . . fins are on the inside

side of tubing, surface area is atly increased permitting a ater transfer of heat in a tube a given length and diameter.

At present, the company reports duction of such tubing has ssed the purely experimental ge and can be produced of a mber of steels in a limited size ge.

miautomatic Milling

Keyways, splines and slots can milled accurately at high rates means of the operating prin- le incorporated in the Hurth 32 semiautomatic machine. Dis- uted by Kurt Orban Inc., New rk, its speed and accuracy are ained by an alternate lowering l raising of the spindle against stops, which can be adjusted very fine tolerances.

Vertical displacement of the os- ating spindle movement can be usted from 0.08 to 0-inch. Low- ng and raising of spindle are draulically controlled and trans- ssion is absolutely play-free.

What's in this NAME?

KENDEX*

It's the Trade-Name for Multiple-edge, Indexable, Tungsten Carbide Insert Tools Produced by Kennametal Inc.

EXCLUSIVE FEATURES

1. *Made of Kennametal*—Kendex inserts have its uniform high hardness and exceptionally long life.
2. *Multiple, precision-ground cutting edges*—enabling a clean, sharp edge to be kept against the work continuously.
3. *Screw-mounted*—can be accurately indexed to a new cutting position, in seconds, without removing tool shank from holder.

OPERATING ADVANTAGES

1. *Minimize downtime for tool changing*—major cause of high-cost operation.
2. *Eliminate tool grinding*—no regrinding; Kendex inserts are thrown away when all cutting edges have been used.
3. "Balanced" tool budget—it's penny-wise and pound foolish to "save" money by excessive reconditioning of old tools, when you can keep new cutting edges on the job continuously with Kendex inserts.

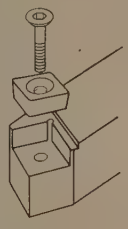
Ask your nearest Kennametal representative for details. Kennametal Inc., Latrobe, Pa.

How KENDEX* Works

1

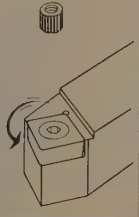
Hard, strong, wear-resistant Kennametal is molded into square, round, or triangular Kendex inserts, which are precision ground.

2



Kendex inserts are mounted to suitable tool holders with socket head screws.

3



When edge becomes dull, insert is turned to new cutting position. When all cutting edges have been used, insert is thrown away; no regrinding.

*Registered Trade-Marks

KENNAMETAL

CEMENTED CARBIDE TOOLING THAT INCREASES PRODUCTIVITY

OFFICES IN PRINCIPAL CITIES

A-3

ANNOUNCING

A NEW TIME-SAVING, MONEY-SAVING PLAN . .

Yellow Strand SPEEDI-SERVICE FOR WIRE ROPE USERS

THE BRODERICK & BASCOM Yellow Strand SPEEDI-SERVICE PLAN

Now you can increase equipment earning time by insuring immediate delivery of the *right* wire rope.

Now you can save time and money with the Yellow Strand Speedi-Service Plan!

There's no extra cost, no obligation and this is how the plan serves you:

1. Have your nearby Broderick & Bascom distributor register your equipment. Each machine and its wire rope requirements is described.
2. The cards are filed in an active file, where your Broderick & Bascom distributor can see in an instant what type and size of rope you will need for any machine.
3. When a line requires replacement, just call your distributor and tell him what machine needs the rope. After a quick reference to his records, he will fill your order immediately from his ample stock of long-lived Yellow Strand.

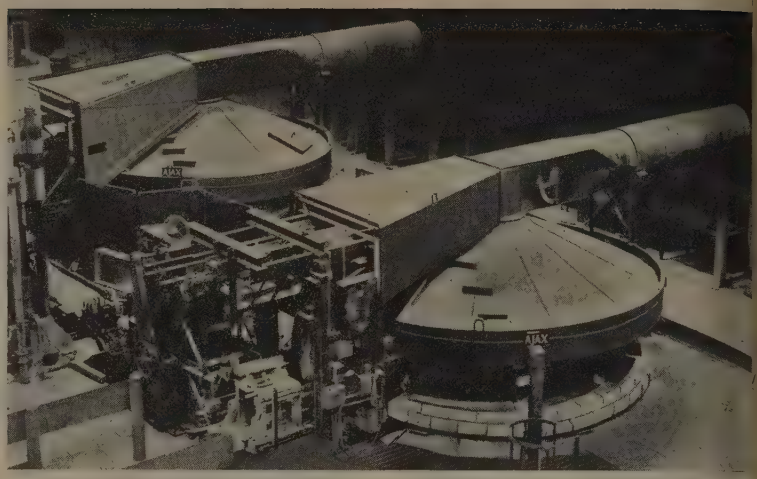
Start saving time and money with the Yellow Strand Speedi-Service Plan. Call your Broderick & Bascom distributor or send for details.

SPECIFY Yellow Strand

For Savings...Safety...Speedi-Service

A product of BRODERICK & BASCOM ROPE CO.

4203 Union Blvd. St. Louis 15, Mo.



HOT-EXTRUSION BILLETS HEATED HERE

. . . salt bath does it in 25 minutes at Watervliet

Rounds Heat Quickly to 2300°F in Special Furnace

ELECTRIC SALT BATH furnaces developed by Ajax Electric Co., Philadelphia, are used to heat stainless steel billets of various analyses to a plastic state prior to hot extrusion.

The furnaces are doughnut-shaped with the work transferred through them by means of a carrousel-like mechanism. Barrels are simply exhaust ducts for venting fumes coming from the molten salt baths.

Operation—Furnaces are used at the Watervliet, New York, plant of Allegheny Ludlum Steel Corp. to heat 300 and 400 series stainless steel billets, 5¼ inches and 7 inches round, and varying in length from 6 inches to 24 inches. Resulting products are either stainless tubing or solid shapes for items such as turbine blades for jet engines.

Molten baths, 2300° F, are an integral part of the Ugine-Sejournet hot extrusion process. Quick uniform heating by means of a molten bath is necessary in order to prevent excessive grain growth and scaling of the billets prior to extrusion.

Heating Time—It takes only 25 minutes to heat a 5¼-inch round from room temperature to 2300° F in these large units. Scaling, oxidation and decarburization are avoided simply because all atmosphere is eliminated in the bath. When billets are removed, a protective fil of salt not only prevents scalin and decarburization, but also r duces friction on the extrusio press dies and mandrels.

One of the furnaces is a 1400-k unit with the bath working dime sion of 11 feet mean diameter, feet wide and 42 inches deep. Se ond unit has a connected load 900 kw, with a bath measuring feet in diameter, and same wid and depth as the first furnace.

Integrated Heat Treating

Production line heat treatin equipment developed by Ferguso Equipment Corp., Pittsburgh, reported to account for conside able savings in floor space a labor. Occupying about one-ha the floor space of some previo units, only one operator is r quired to supervise the work.

Designed specifically to fit in a production line, the machine pr washes, automatically harden quenches, washes, rinses, dri and tempers. Varying sizes types can be fed into the unit a two to four types can be kept se regated. Two conveyor lin pass through the furnace a length of time in the furnace c be varied for each line.

The company is building fo sizes to treat 50, 300, 450 and 7 pounds per hour.

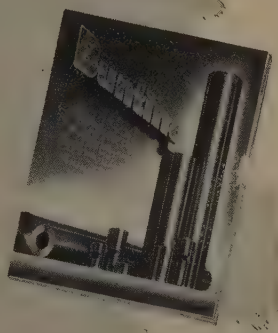
THE ONE YOU WANT?

He has it!

NO NEED to search through directories or ask people about it. When you need a finished bearing, a bar of bearing bronze or any other one of countless items of industrial materials and equipment, just phone your industrial distributor.

YOUR BUNTING distributor is the leading industrial distributor, or a stock-carrying specialist in certain industrial items. With money-saving convenience, he can supply hundreds of different sizes of completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars.

Ask him for a Bunting Catalog which gives complete dimensional and technical data.



Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

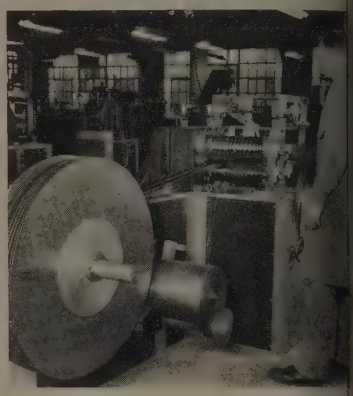
The Bunting Brass & Bronze Company • Toledo 1, Ohio • Branches in Principal Cities • Distributors Everywhere

Tailored Slitting

MORE IN-PLANT slitting should result from compact machines developed by Stanat Mfg. Co., Long Island City, N. Y. By using standardized interchangeable parts, Stanat's engineers have designed a series of tailored slitting units to meet a wide variety of manufacturing needs.

By winding the slit coils on core plates, expensive pushoff mechanisms may be eliminated. Cost has been further reduced by unit-mounting the recoiler on the slitter base, yet at sufficient distance from the cutters to minimize the camber effect of fan-out.

Recoiler—Recoiler tension control is another feature. When slitting light gage materials to close tolerances, conventional recoilers sometimes tear stock or otherwise interfere with production of accurate work. On these units, tension is adjustable while the machine is running by the use of a handwheel conveniently located at the operator's position. Since the amou of tension required varies with di ferent materials, number of stri being cut, width and thickness



STANDARDIZED SLITTERS
. . . more in-plant strip productio

the strips and coil diameter, th adjustability feature is importa for successful results.

Scrap disposal (from trim cut is effected by providing a conve iently-located arbor, with its ow tension control, which winds t scrap into an easy-to-hand bundle.

Fretting Corrosion Digest

Fretting corrosion may be ge erally defined as a surface damag that occurs when two solid su faces are contacted under rel tively high loads and with sm relative (vibratory) motions.

Users of the kind of machine where fretting corrosion might o cur often do not recognize it s such. As a result, steps taken o prevent the damage are not alwa successful.

Numerous studies of the pro lem have been made in the past a are being continued today by bo government and industrial grou as well as by schools and resear institutions.

Symposium Available—Americ Society for Testing Materials, Co mittee D-2 on Petroleum Produ and Lubricants, presented a sy posium to further research on th subject. Now available in an 8- page booklet, the symposium in cludes eight sections, each of wh is written by an expert.

Copies of the book may be o tained from the society for $2.

NOW'S THE TIME FOR A *Burr-Master**

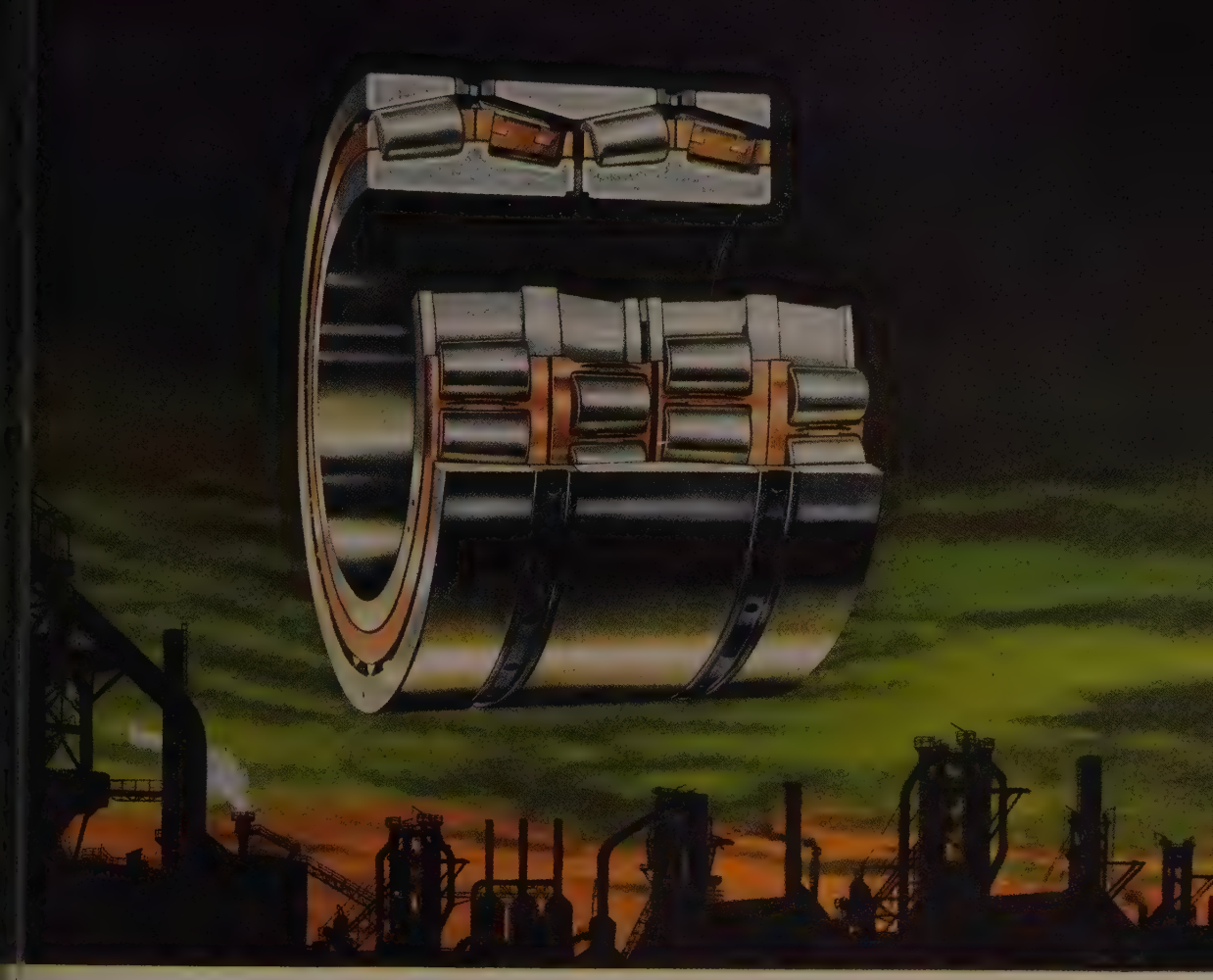
Yes, when your production gears need deburring and chamfering your answer is a Burr-Master. Capable of chamfering the entire tooth form and root, Burr-Masters are available in a wide range of models to meet every need.

No matter what the length of your production runs or the size gears to be chamfered, the Universal Burr-Master (shown) holds the answer to many of your finishing problems. The newest member of the Burr-Master line, it handles both spur and helical gears as well as straight and involute form external splines.

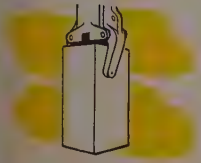
Complete details in Bulletin 103-60. Ask for it.

**Reg. Pat. Pending*

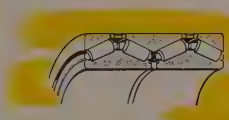
14230 BIRWOOD AVE. MODERN DETROIT 38, MICHIGAN
Industrial Engineering Co.



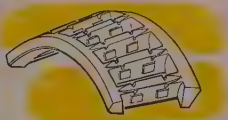
Here's why **TORRINGTON** work roll bearings establish rolling mill records



ighest quality electric fur- ace alloy steels are used— rburized and heat treated to rovide toughness, hardness, ability and uniformity.



Torrington Work Roll Bearings are designed and built with high thrust capacity to give better service under actual operating conditions.



One-piece cast-bronze cages with machined pads in each roller pocket reduce wear, lengthen bearing life and improve performance.

Accuracy in workmanship is characteristic of all TORRINGTON Bearings. This means a lower cost per ton of your finished product.

Many sizes of TORRINGTON WORK ROLL Bearings are available from stock for immediate shipment.

TORRINGTON WORK ROLL Bearings—both two-row and four-row types—are standard in a wide variety of sizes.

For lower operating costs, greater rolling efficiency, less down time...specify TORRINGTON!

TORRINGTON BEARINGS

pherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

ALL THESE PROMPTLY AVAILABLE from Newport Steel

PRODUCTS OF NEWPORT STEEL

- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Electric Weld Line Pipe
- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

With their continuing expansion of facilities, Newport Steel is becoming more competitive on most grades of flat rolled steel and more flexible in production schedules and delivery. Unvarying quality and wide variety of products also make this mill a favorite with all kinds of manufacturers. Another customer advantage is Newport's location in the fastest growing industrial area in America, with short haul and economical delivery by rail, barge or truck. Quality, location and service all combine to make Newport the logical source of steel for Middle West and South. Let us prove our ability to serve you well.

ECONOMICAL WATERAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South.

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

STEEL

March 15, 1954

Market Outlook

ARCH is failing to be the good steel producing onth that some people hoped it would be.

Production rate thus far this month is lower an in January or February.

Marking the third consecutive week of deine, the ingot output rate in the week ended ar. 14 was at the year's low point of 68.5 r cent of capacity. This is a decrease of 1.5 ints from the preceding week's 70 per cent, hich until now was the year's low mark.

BOVE AVERAGE—While the latest national erating rate is 68.5 per cent, not all of the ountry's producing districts were that low. Alough only two districts showed increases those o were the highest in the nation: Detroit, ith 80.5 per cent; and Wheeling, with 82.5.

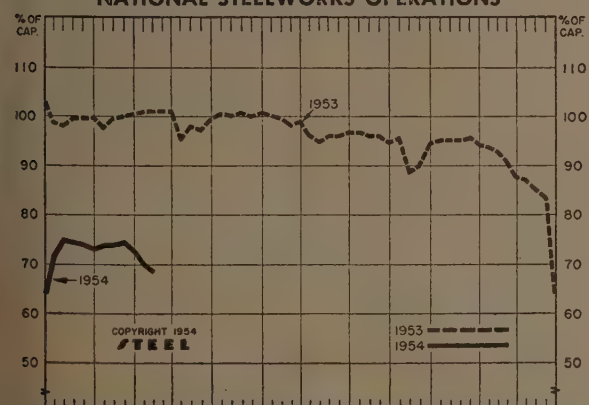
HICH WAY?—Which way will the national eel ingot production rate go from here? You n find influences in two directions: There e indications the automakers, the largest ers of steel, may reduce their steel orders this onth. On the other hand, some steel producers ho have been restricting their ingot output hile they use up stocks of semifinished steel ill eventually exhaust these stocks. When they , they will have to increase their ingot proiction, if business does not slacken further. lso suggesting the possibility of an improvent in ingot production are scattered reports a slight strengthening of steel demand.

OPE—Some of the present strengthening may em from seasonal factors, but a little later in ie year there could be a firming that would e longer lived. Steel buyers who have been ving off their inventories will have to come back into the market eventually. Also there are indications that business is improving in some sectors. One steelmaker noticed a slight rise in orders for the last three weeks, the upturn not being limited to any single consuming field. In that same geographical area warehouses detect a quickening in inquiries and buying.

PREPAREDNESS—In an effort to prevent business slipping away from them, some mills producing hot-rolled carbon steel sheets are doing something they haven't done for a long time. They are building up inventories of the more popular items so as to get a competitive advantage on deliveries. There also is an inclination to build up mill stocks of galvanized sheets. However, demand for them is relatively strong because of the needs of air-conditioning equipment producers and the farm trade. In fact, one of the most clearly recognized areas of a pickup in demand for steel comes from farm equipment companies.

UNDER PRESSURE—In the meantime, the generally lower demand for steel is having a moderately depressing effect on steel prices. After 11 consecutive weeks of steadiness, STEEL's price composite on finished steel declined in the week ended Mar. 11 to $113.73 a net ton from the preceding week's $113.91. Also reflecting the pressure on prices and effect of foreign competition is the reduction by United States Steel Export Co. of its export prices on 11 major items to about parity with the domestic market on the East Coast. The price line is being held, however, on domestic prices of tin plate and tin mill products through Sept. 30.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Mar. 14	Change	Same Week 1953	Same Week 1952
Pittsburgh	78	— 3.5	107	102.5
Chicago	78.5	— 1*	105	105.5
Mid-Atlantic	65	— 4	97	98
Youngstown	66	— 4	106	102
Wheeling	82.5	+ 0.5	100.5	100
Cleveland	65	— 1	102	98
Buffalo	63.5	0	106.5	104
Birmingham	78.5	— 1.5	98	104
New England	60	— 5	89	80
Cincinnati	71.5	— 1	100.5	91.5
St. Louis	43.5	0	87	79
Detroit	80.5	+17	107	106
Western	74	— 6.5	113	103
National Rate	68.5	— 1.5	101	101.5

INGOT PRODUCTION‡

	Week Ended Mar. 14	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	102.2	105.0	110.4	142.2
NET TONS (In thousands)	1,642†	1,686	1,774	2,284

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Mar. 9

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complet description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.43
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.12
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.23
Axles, railway	7.250	Bars, reinforcing	4.863	Pipe, galv., buttweld (100 ft)	17.567	Wire, drawn, carbon	7.71
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.940	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.54
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.92
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.48
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.73
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.704	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	18.00
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.875	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Mar. 9 1954	Mar. 2 1954	Month Ago	Feb. Average
(1947-1949=100)	140.9	140.9	140.9	140.9

STEEL's FINISHED STEEL PRICE INDEX

	Mar. 11 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	154.85
Index in cents per lb	5.140	5.140	5.140	4.912	4.195

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Mar. 11 1954	Week Ago	Month Ago	Year Ago	5 Yr Ag
Finished Steel, NT	$113.73	$113.91	$113.91	$110.98	$97.3
No. 2 Fdry Pig Iron, GT.	56.54	56.54	56.54	55.04	46.6
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.2
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.3
Steelmaking Scrap, GT	24.17	24.50	27.50	43.17	36.3

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 6 of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Mar. 11 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.475-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅜-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Mar. 11 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.0
Basic, Valley	56.00	56.00	56.00	54.50	46.0
Basic, deld Phila.	59.66	59.66	59.66	59.25	50.3
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.5
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.2
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.5
No. 2 Fdry, deld, Phila.	60.16	60.16	60.16	59.75	50.8
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.3
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.4
Malleable, Valley	56.50	56.50	56.50	55.00	46.5
Malleable, Chicago	56.50	56.50	56.50	55.00	46.5
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.0

*78-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$25.50	$25.50	$29.50	$44.00	$37.0
No. 1 Heavy Melt, E. Pa.	22.00	23.00	26.00	43.00	38.0
No. 1 Heavy Melt, Chicago	25.00	25.00	27.00	42.50	34.0
No. 1 Heavy Melt, Valley	23.50	23.50	27.50	44.25	37.7
No. 1 Heavy Melt, Cleve.	20.50	20.50	25.50	44.25	35.2
No. 1 Heavy Melt, Buffalo	24.00	25.00	25.00	45.50	38.7
Rails, Rerolling, Chicago	36.50	36.50	36.50	53.50	45.7
No. 1 Cast, Chicago	31.50	30.50	29.50	44.00	41.5

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.5
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.0
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.4

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.75-30.00 deld. Conn. Valley, 29.875-30.125 deld. Midwest; La 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 12.80, chemical 12.90, co roding 12.90, St. Louis, New York basis, a 0.20.

Lithium: 98%, $11-$14 per lb, depending quantity.

Magnesium: 99.8%, selfpalletizing pig 27.0 notched ingot 27.75, 10,000 lb or more, f.o. Freeport, Tex. For Port Newark, N. J., a Madison, Ill., add 1.20 for pig and 1.25 f ingot. Sticks, 1.3 in. diameter, 46.00, 100 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, and R 32.50; alloy M 34.50, 10,000 lb or mo f.o.b. Freeport, Tex., or Madison, Ill. A 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New Yor $191-$194 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduc $3.40 per lb; pressed ingot $4.06 per l sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 and larger), unpacked 60.60; 25-lb pigs 62.6 "XX" nickel shot 63.65; "F" nickel shot

DAILY NONFERROUS PRICE RECORD

	Price Mar. 11	Change		Previous Price	Feb. Avg.	Jan. Avg.	Mar. 1953 Avg.
Copper	29.75-30.00	Mar.	3	29.50-30.00	29.750	29.750	30.510
Lead	12.80	Mar.	10	12.55	12.610	13.060	13.300
Zinc	9.75	Mar.	10	9.25	9.369	9.760	11.000
Tin	90.50	Mar.	11	90.25	85.181	85.100	121.500
Nickel	60.00	Jan.	14	56.50	60.000	60.000	60.000
Aluminum	21.50	July	15	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar.	9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, deld.; Magnesium 99.8%, Freeport, Tex.

...g for addition to cast iron, 60.00; prices f.o. Port Colborne, Ont., including import du... New York basis, add 0.2¢.

Os...m: $140-$150 per troy oz nom.

Pa...dium: $21 per troy oz.

Pl...um: $90-$92 per troy oz from refineries.

Ra...m: $16-$21.50 per mg radium content, de...ling on quantity.

Rh...um: $125 per troy oz.

Ru...nium: $75-$80 per troy oz.

Se...um: 99.5%, $5-$6 per lb.

So...n: 16.50, carlots; 17.00 l.c.l

Ta...lum: Sheet, rod $39.00 per lb; powder $3... per lb.

Te...ium: $1.75 per lb.

Th...um: $12.50 per lb.

Ti... Straits, New York, 90.50.

Ti...ium: Sponge, 99.3+ %, $5 per lb.

Tu...sten: Powder, 98.8%, carbon reduced, 10... lb lots $4.95 per lb f.o.b. shipping point; le...than 1000 lb $5.10; 99+% hydrogen re...du... $5.85. Treated ingots $7.95.

Zi... Prime Western 9.75, brass special 10.00, in...ediate 10.25, E. St. Louis, freight al...lo... over 0.50 per pound. High grade 11.10, sp...al high grade 11.25, die casting alloy in... 13.75, deld.

Zi...conium: Sponge $10 per lb; powder elec...tr...s grade $15, flash grade $11.50.

(N...: Chromium, manganese and silicon met...al...re listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Al...inum Ingot: Piston Alloys 18.75-19.50; No. 12 foundry alloy (No. 2 grade) 18.25-19...; 5% silicon alloy, 0.60 Cu max., $1.50-22...; 13 alloy, 0.60 Cu max., $1.50-22.00; 19...alloy 20.50-21.00; 108 alloy 19.00-19.50; ...deoxidizing grades, notch bars, granu...las... or shot: Grade 1, 19.50-20.00; grade 2, 18...19.00; grade 3, 17.00-17.50; grade 4, 15...17.00.

Br... Ingot: Red brass, No. 115, $3.50; tin bro...e No. 225, 34.25, No. 245, 28.50; high-le... tin bronze, No. 305, 27.75; No. 1 ye...w, No. 405, 19.75; manganese bronze No. 42...24.25.

Ma...esium Alloy Ingot: AZ63A, 31.50; AZ91B, 29...; AZ91C, 31.50; AZ92A, 31.50

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bo... soft, f.o.b. eastern mills, 100,000 lb lots, 35...; 30,000 lb lots, 35.48; l.c.l. 35.98. Weather...of, 100,000 lb, 36.28; 30,000 lb, 36.58; l.c... 37.03. Magnet wire deld., 15,000 lb or m... 41.33; l.c.l., 42.58.

LEAD

(F...s to jobbers f.o.b. Buffalo, Cleveland, Pi...burgh.) Sheets, full rolls, 140 sq ft or m... $18.00 per cwt; pipe, full coils $18.00 pe...wt; traps and bends, list prices plus 30%.

TITANIUM

(F...s per lb, 100,000 lb and over, f.o.b. mill.) Sp...e, $15; sheared mill plate, $12; strip, $15; w... $10; forging billets, $6; hot-rolled and fo...d bars, $6.

ZINC

Sh...t 23.00, f.o.b. mill, 36,000 lb and over. R...n zinc in coils, 19.50-20.50, f.o.b. mill, 30...0 lb and over. Plates 19.00-22.25.

ZIRCONIUM

P... $27; H.R. strip $28; C.R. strip $35; fo...d or H.R. bars $27; wire, 0.015 in., 1 c... per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sh...t, C.R. ...	86.5	67.5	92.5
Sh... C.R. ...	92.5	70.5	98.5
P... H.R. ..	84.5	66.5	90.5
R... Shapes ..	82.5	65.5	88.5
Se...less Tubes	115.5	100.5	137.5
Sh... Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 400 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	....
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.3
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.3	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	50.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	43.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares. Class 1, 50.2-36.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¼	$15.05	2	$ 46.30
½	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 23.00-23.50; No. 2 copper 21.00-21.50; light copper 19.00-19.50; No. 1 composition red brass 16.50-17.00; No. 1 composition turnings 16.00-16.50; mixed brass turnings 10.50-11.00; new brass clippings 16.00-16.50; No. 1 brass rod turnings 11.50-12.00; light brass 10.00-10.50; heavy yellow brass 12.00-12.50; new brass rod ends 14.00-14.50; auto radiators, unsweated, 12.50-13.00; cocks and faucets 14.00-14.50; brass pipe 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plate 5.00-5.50; linotype and stereotype 12.25; electrotype 10.50; mixed babbitt 11.50-12.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.75; new die cast scrap, 3.50; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 14.00-14.50; 51S, 52S clippings 13.50-14.00; 14S, 17S, 24S clippings 13.00-13.50; mixed clippings 12.50-13.50; old sheet 11.50-12.00; old cast 11.50-12.00; clean old cable, free of steel 14.00-14.50; borings and turnings 11.50-12.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.50-25.00; No. 2 copper 23.00-23.50; light copper 21.50-22.00; refinery brass (60% copper) per dry copper content 21.00; auto radiators, 14.25, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 24.50-25.00; No. 2 copper 23.00-23.50; light copper 21.50-22.00; No. 1 composition solids 18.00; heavy yellow brass solids 14.00; yellow brass turnings 13.00; radiators 14.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.085; 200-499 lb $1.07; 500-999 lb $1.065; 1000 lb or more $1.06.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-5000 lb 11.35; 5000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00, 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 69.6; 100-600 lb 55.4; 700-1900 lb 53; 2000-9900 lb 51.2; 10,000 lb or more 50.1.

Stannous Chloride (Anhydrous): Less than 50 lb $1.551; 50 lb $1.211; 100-300 lb $1.061; 400-900 lb $1.037; 100-1900 lb $1.013; 2000-4900 lb 97.6; 5000-19,000 lb 91.5; 20,000 lb and over 85.4.

Stannous Sulphate: Less than 50 lb $1.252; 50 lb 95.2; 100-1900 lb 93.2; 2000 lb and over 91.2.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

BASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Co...per	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yel...w Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Re... Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	23.250
Lo... Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.875
Na...al Brass	45.76	40.07	52.80	45.92	18.250	18.000	17.500
Co...mercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Ni...el Silver, 10%	55.36	59.43g	57.69	....	28.625	28.375	31.875
Ph...sphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Si...on Bronze	52.71	51.96	52.75	70.11e	25.125	24.875	24.125
Ma...nganese Bronze	49.48	43.62	54.06	....	13.250	18.000	17.500
Ni...s Metal	43.96	39.77	....	....	15.625	15.375	17.375

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping p...t. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Nonferrous Metals

Lead and zinc prices rise after nearly two years of weakness. Upturn stems from a surprising rush of orders from lead users, followed by a pickup in zinc demand

END of the bust cycle is in sight for the nonferrous misery twins, lead and zinc.

Boom is by no means around the corner, but a respectable recovery is anticipated. After the price mauling the two metals have undergone in about the last two years, any degree of rebound, however small, will be welcomed by sellers.

Happier Days—Until last week zinc sold for exactly half its 19.50-cent level of price ceiling days. Lead is a little better off now at 6 cents under its former 1-cent ceiling.

A surprising rush of orders last week by lead users for immediate delivery and for April needs, combined with perked-up export business on rising European demand, sent the heavy metal's price inching up in two quarter-cent increments to a base of 13.00 cents, New York. It was lead's first change since Feb. 18, last upward move was in July, 1953.

The rise was anticipated by most buyers, who switched from average price ordering to a flat price. Futures market showed strength, too, and the buying activity mounted as fabricators sensed the distress sales were ending, for the present time at least.

Transferred Strength—In sympathy with the lead rise, zinc showed new strength. Individual orders were larger and more sales were made at a flat price than have been recorded in some time.

As a result, sellers moved boldly and raised prices by a half-cent, only the second advance in zinc in its last ten price moves. Prime Western now brings 9.75 cents, E. St. Louis. Die casters were the major buyers at the new levels.

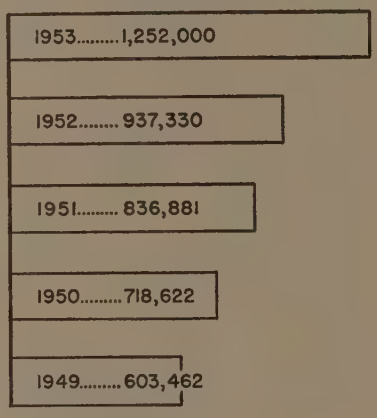
Zinc producers were happily wrong in their forecasts of a 5000-ton or more rise in stocks during February. Increase was less than 1300 tons and kept total stocks entering March just 6 tons shy of the 200,000-ton mark. It was the ninth consecutive month of inventory increase.

Shipments increased by 6000 tons to 60,692 tons, nearly equaling production. The 68,000-ton output was 10,000 tons under January, but daily turnout slipped only about 100 tons. March statistics should show the effects of cumulative smelter curtailments.

What To Do?—Further reason for lead-zinc optimism may come from Washington at month end. Due Mar. 31 is a report on lead and zinc from the Senate Finance Committee. There's also a possibility that recommendations requested by the national lead-zinc committee for relief under the reciprocal trade agreements act will be presented at the same time, though this report is not due until June.

GROWING

Primary Aluminum Production in U. S.
(Tons of 2000 pounds)



Source: U. S. Bureau of Mines

Possibilities of help include higher tariffs, a quota system for imports, government subsidies for domestic mining and renewed stockpiling. Under the escape clause of the R.T.A.A., duties could be raised an additional 1.4 cents on slab zinc and about 0.7 cent on ore and concentrates. Lead could be increased by a maximum of about 1.5 cents on pig, 1.05 cents on ore and concentrates.

The Probabilities—A quota system setup would mean government taking over all imports, with the attendant red tape and controls. Subsidies would be equally difficult to establish and maintain. A sliding-scale import tax has been dismissed as too complicated, in government thinking.

Chances are better for renewed stockpiling. Industry men point out that no new government commitments have been made in the last year for either lead or zinc, compla that stockpile additions are ma only in periods of shortage.

A compromise of this sort is like to emerge when action is final taken: A moderate increase in in port duties under the escape claus plus a small increase in stockpile pu chases. Industry would probab agree to such a plan. Market m are of the opinion that an announc ment by the government that it wou buy 25,000 tons of lead and 50,0 tons of zinc would stimulate indust to buy a similar tonnage and g both metals out of their present pr dicament.

Extruders Pinched

Last fall when competition sha pened in aluminum window man facturing, independent extruders sni ped prices regularly to get busine resulting in generally lower levels f all extrusions of 63S alloy, used larg ly for building and architectural a plications. On Feb. 1 these goi prices became official as the entire i dustry, including integrated comp nies, adopted them. Now the indepen ent extruders are calling for a balan ing of these reductions by lower pric on pig and ingot. Primary pr ducers demur, saying the problem of the extruders' own making. Low prices are not in the cards now.

Better than Expected

Surprising just about everyone f miliar with the industry, shipmen of magnesium castings and wroug products last year were not nearly bad as expected. Statistics issued the Magnesium Association show castings shipments for the year on 1 per cent below those of 1952, 17,299 tons. Wrought product shi ments of 8443 tons were 7 per ce less than in 1952.

Nonferrous Briefs

• Government's passively benign a titude towards an international t cartel, announced by the State depa ment, caused tin price to jump to highest level in eight months. Ne York dock troubles helped put t squeeze on spot metal.

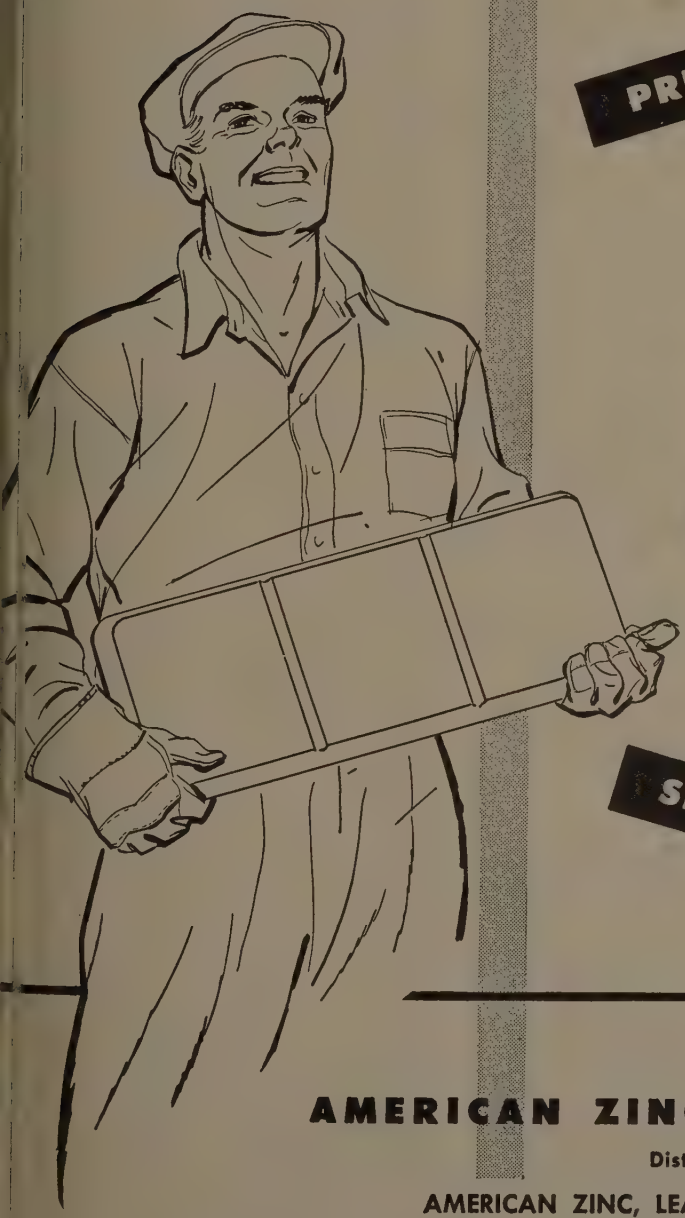
• Brass and bronze ingot make are still kicking around the id of boosting prices on their produ Scrap price rise has increased th costs, and the price reduction ingot last month didn't increase co sumption as was hoped.

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC



PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 169. Key to footnotes, page 171.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa, Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 ....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....75.50
Seattle B3 .....89.00
So.Chicago R2,U5,W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14 82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo,R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity, Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ....5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 .....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 ....4.10
Bethlehem,Pa. B2 ....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14.4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 .....4.10

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.10
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 ....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.925
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ....6.175
Ind.Harbor, Ind. Y1 ...6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

PILING

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 .....4.925

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 ....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 ....4.10
Conshohocken,Pa. A3 ..4.10
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ...4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
LoneStar,Tex. L6 ....4.50
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1 ..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 .....5.55
Coatesville,Pa. L7 ....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 ....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ...4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ....5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala T2 ....6.225
Bethlehem,Pa. B2 ....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 ....6.225
Lackawanna,N.Y. B2..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6 225
So.Duquesne Pa. U5 ...6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.35
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12,R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ...5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13.5.20
Hartford,Conn. R2 ....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 ....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 ....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 ....6.325
Carnegie,Pa. C12 .....6.32
Chicago W18 .....6.32
Cleveland A7, C20 .....6.32
Detroit R7 .....6.42
Detroit P17 .....6.47
Detroit B5 .....6.52
Donora,Pa. A7 .....6.32
Elyria,O. W8 .....6.32
Gary,Ind. R2 .....6.32
Hammond,Ind. L2,M13.6.32
Hartford,Conn. R2 ....6.77
Harvey,Ill. B5 .....6.32
Lackawanna,N.Y. B2 ..6.32
Mansfield,Mass. B5 ....6.77
Massillon,O. R2, R8 ...6.32
Midland,Pa. C18 .....6.32
Monaca,Pa. S17 .....6.32
Newark,N.J. W18 .....6.6
Plymouth,Mich. P5 ....6.52
So.Chicago,Ill. R2,W14.6.32
SpringCity,Pa. K3 .....6.5
Struthers,O. Y1 .....6.32
Warren,O. C17 .....6.32
Waukegan,Ill. A7 .....6.32
Worcester,Mass. A7 ...6.62
Yougstown F3, Y1 ....6.32

BARS, Reinforcing (Fabricators)
AlabamaCity.Ala. R2 ...4.1
Atlanta A11 .....4.3
Buffalo R2 .....4.1
Cleveland R2 .....4.1
Emeryville,Calif. J7 ....4.9
Fairfield,Ala. T2 .....4.1
Fairless,Pa. U5 .....4.3
Fontana,Calif. K1 .....4.8
Gary,Ind. U5 .....4.1
Houston S5 .....4.5
Ind.Harbor,Ind. I-2, Y1.4.1
Johnstown,Pa. B2 .....4.1
KansasCity,Mo. S5 ....4.7
Lackawanna,N.Y. B2 ..4.1
LosAngeles B3 .....4.8
Milton,Pa. M18 .....4.1
Minnequa,Colo. C10 ....4.7
Niles,Calif. P1 .....4.8
Pittsburg,Calif. C11 ....4.8
Pittsburgh J5 .....4.1
SandSprings,Okla. S5 ..5.0
Seattle B3, N14 .....4.9
So.Chicago,Ill. R2 .....4.1
So.Duquesne,Pa. U5 ....4.1
So. SanFrancisco B3 ....4.9
SparrowsPoint,Md. B2 ..4.1
Sterling,Ill. (1) N15 ...4.1
Struthers,O. Y1 .....4.1
Torrance,Calif. C11 ....4.8
Youngstown R2, U5 ....4.1

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼ -1" B2 ...5.5
KansasCity S5 .....6.3
LosAngeles B3 .....5.9
Marion,O. P11 .....5.5
Seattle N14 .....5.9
Seattle B3 .....5.9
So.SanFrancisco B3 ....5.9
SparrowsPt, ½-1" B2 ...5.5
Williamsport,Pa. S19 ..5.4

RAIL STEEL BARS
Avis,Pa.(3) J8 .....4.
ChicagoHts.(3) C2, I-2.4.
ChicagoHts.(4) C2, I-2..4.
FortWorth,Tex.(26) T4..4.
Franklin,Pa.(3) F5 ....4.
Franklin,Pa.(4) F5 4
Marion,O.(3) P11 .....4.
Moline,Ill.(3) R2 4
Tonawanda(3,4) B12 ...4.
Williamsport,Pa.(3) S19 4
Williamsport,Pa.(4) S19.5.

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 10.
Economy,Pa.(D.R.)B14 12.
Economy(Staybolt) B14 13.
McK.Rks.(S.R.) L5 ....10.
McK.Rks.(D.R.) L5 ....14.
McK.Rks.(Staybolt) L5.15.

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ...3.9
Allenport,Pa. P7 .....3.9
Ashland,Ky.(8) A10 ...3.9
Cleveland J5, R2 .....3.9
Conshohocken,Pa. A3 ...4.
Detroit M1 .....4.
Ecorse,Mich. G5 .....4.1
Fairfield,Ala. T2 .....3.9
Fairless,Pa. U5 .....4.0
Fontana,Calif. K1 .....4.
Gary,Ind. U5 .....3.9
Geneva,Utah C11 .....4.0
GraniteCity,Ill. G4 ....4.1
Ind.Harbor,Ind. I-2, Y1.3.9
Irvin,Pa. U5 .....3.9

no,Ind. C16 .....4.025
wanna,N.Y. B2 ..3.925
ail,Pa. U5 .....3.925
ort,Ky. N9 .....3.925
O. N12 .....5.175
urg,Calif. C11 ....4.625
urgh J5 .....3.925
nouth.O. P12 ....3.925
iale,Ill. A1 .....3.925
n.Pa. S3 .....3.925
icago.Ill. W14 ...3.925
owsPoint,Md. B2..3.925
enville,O. W10 ...3.925
nce,Calif. C11 ....4.625
n,O. R2 .....3.925
on,W.Va. W6 ....3.925
gstown U5, Y1 ...3.925

S H. R. (19 gage)
maCity,Ala. R2..5.225
O. R1 .....5.05
no,Ind. C16 .....5.025
ield,O. E6 .....5.05
O. N12 .....4.775
nce,Calif. C11 ....5.875

S, H.R. (14 ga. heavier)
h-Strength Low-Alloy
and J5. R2 .....5.90
ohocken,Pa. A3 ..5.90
e,Mich. G5 .....6.10
eld,Ala. T2 .....5.90
na,Calif. K1 ....6.675
Ind. U5 .....5.90
arbor,Ind. I-2 ...5.90
arbor,Ind Y1 ....6.40
Pa. U5 .....5.90
wanna(35) B2 ...5.90
ail,Pa. U5 .....5.90
urgh J5 .....5.90
n.Pa. S3 .....5.90
icago,Ill. U5 ....5.90
owsPoint(36) B2 ..5.90
en,O. R2 .....5.90
on,W.Va. W6 ....5.90
gstown U5 .....5.90
gstown Y1 .....6.40

S, Hot-Rolled Ingot Iron
Gage and Heavier)
and,Ky.(8) A10 ..4.175
land R2 .....4.525
arbor,Ind. I-2 ...4.175
en,O. R2 .....4.525

S, Cold-Rolled Steel
mmercial Quality)
sport,Pa. P7 ....4.775
land J5. R2 .....4.775
e,Mich. G5 .....4.975
eld, Ala. T2 ....4.775
ss,Pa. U5 .....4.875
nsbee,W.Va. F4 ..4.775
na,Calif. K1 ....5.875
Ind. U5 .....4.775
teCity,Ill. G4 ....4.975
arbor,Ind. I-2,Y1.4.775
Pa. U5 .....4.775
wanna,N.Y. B2 ..4.775
etown.O. A10 ....4.775
burg,Calif. C11 ...5.725
urgh J5 .....4.775
nouth.O. P12 ....4.775
owsPoint,Md. B2..4.775
enville.O. W10...4.775
en,O. R2 .....4.775
on,W.Va. W6 ....4.775
gstown Y1 .....4.775

S, Cold-Rolled
h-Strength Low Alloy
and J5. R2 .....7.225
e,Mich. G5 .....7.425
na,Calif. K1 ....8.275
Ind. U5 .....7.225
naHarbor,Ind. Y1.7.725
Pa. U5 .....7.225
wanna(37) B2 ..7.225
urgh J5 .....7.225
owsPoint (38) B2.7.225
en,O. R2 .....7.225
on,W.Va. W6 ....7.225
gstown Y1 .....7.725

S, Cold-Rolled Ingot Iron
land R2 .....5.375
etown.O. A10 ....5.375
en,O. R2 .....5.375

S, Culvert

	Cu Alloy	Cu FE
nd.Ky A10	.6.325	....
n.O. R2	...6.475	6.925
eld T2	....6.075	6.325
Ind. U5	...6.075	6.325
arbor I-2	..6.075	6.325
Pa. U5	....6.075	6.325
mo.Ind. C16	6.175	....
nsFry..O.W10	6.075	....
.Calif. C11	..6.825	....
owsPt. B2..	6.075	....
nce.Cal. C11	7.075	....

S, Culvert

	Pure Iron
nd.Ky. A10	....6.575
eld.Ala. T2	.....6.325
nsFerry.O. W10	..6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel
Bulter,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Bulter,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ..5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 ....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 ....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackaw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2.3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 ....7.80
Gary,Ind. U5 .....6.10
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ...5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ...4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 .....5.45
Bridgeprt,Conn.(10) S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ..5.70
Ind.Harbor,Ind. I-2 ...5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket.R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I. (11) N8 12.15
Pawtucket.R.I. (12) N8 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 ElectroMetallurgicalCo.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible SteelCo.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.45	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Indianapolis C8	...	*7.80*	*8.60*	*10.55*	....
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15.	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass W12	...	...	12.50	....	....
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	....
Vandergrift,Pa. U5	...	8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	....
Zanesville,O. A10	...	8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Armature	Electric	Motor	Dynamo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R SHEETS (22 Gage) (Cut Lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENTGHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35†
Warren,O. R2	....	....	....	....	12.35†

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 1.50 Coke (Base Box)	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville, O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill.(1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
RoeblingN.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt., Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8"Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7,T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE,Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.275
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Portsmouth,O.P12	6.675 ....
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Sterl'g(1)(48)N15	6.675 7.175
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	144
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	142

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	1
SparrowsPoint,Md. B2	1
Sterling,Ill.(1) N15	1

WIRE, Barbed	C
AlabamaCity R2	153
AliquippaJ5	1
Atlanta A11	1
Bartonville,Ill. K4	1
Crawfordsville,Ind. M8	1
Donora,Pa. A7	1
Duluth,Minn. A7	1
Fairfield,Ala. T2	1
Houston,Tex. S5	1
Johnstown,Pa. B2	1
Joliet,Ill. A7	1
KansasCity,Mo. S5	1
Kokomo,Ind. C16	1
Minnequa,Colo. C10	1
Monessen,Pa. P7	1
Pittsburg,Calif. C11	1
Rankin,Pa. A7	1
So.Chicago,Ill. R2	1
S.SanFrancisco C10	1
SparrowsPoint,Md. B2	1
Sterling,Ill. (1) N15	1

† Based on 5c zinc; * zinc; ** Subject to equalization extras.

WIRE, (16gage)	An'ld. Ga. Stone Sto
Ala.City R2	12.50 14.0
Aliquippa J5	12.50 14.
Bartonville K4	12.60 14
Buffalo W12	12.50
Cleveland A7	12.50
CrawfordsvilleM8	12.50 14
Fostoria,O. S1	12.60 14
Johnstown B2	12.50 14.
Kokomo C16	12.60 14.
Minnequa C10	12.75 14.4
Palmer,Mas.W12	12.50 14.
Pitts.,Calif. C11	12.85 14.
SparrowsPt. B2	12.60 14.
Sterling(1) N15	12.50 14
Waukegan A7	12.50 14.
Worcester A7	12.80

* Based on 11c zinc; ** Subject to equalization extras.

NAILS, Stock	C
To dealers & mfrs. (7)	
AlabamaCity,Ala. R2	
Aliquippa,Pa. J5	
Atlanta A11	
Bartonville,Ill. K4	
Chicago,Ill. W13	
Cleveland A9	
Crawfordsville,Ind. M8	
Donora,Pa. A7	
Duluth,Minn. A7	
Fairfield,Ala. T2	
Galveston,Tex. D7	
Houston,Tex. S5	
Johnstown,Pa. B2	
Joliet,Ill. A7	
KansasCity,Mo. S5	
Kokomo,Ind. C16	
Minnequa,Colo. C10	
Monessen,Pa. P7	
Pittsburg,Calif. C11	
Rankin,Pa. A7	
So.Chicago,Ill. R2	
SparrowsPt., Md. B2	
Sterling,Ill. (1) N15	
Worcester,Mass. A7	

NAILS, CUT (100 lb keg)	
To dealers (33)	
Conshohocken,Pa. A3	$3
Wheeling,W.Va. W10	3

STAPLES, Polished Stock	
To dealers & mfrs. (7)	
AlabamaCity,Ala. R2	
Aliquippa,Pa. J5	
Atlanta A11	
Bartonville,Ill. K4	
Crawfordsville,Ind. M8	
Donora,Pa. A7	
Duluth,Minn. A7	
Fairfield,Ala. T2	
Johnstown,Pa. B2	
Joliet,Ill. A7	
Kokomo,Ind. C16	
Minnequa,Colo. C10	
Monessen,Pa. P7	
Pittsburg,Calif. C11	
Rankin,Pa. A7	
So.Chicago,Ill. R2	
SparrowsPt., Md. B2	
Sterling,Ill. (1) N15	
Worcester,Mass. A7	

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	15
Duluth,Minn. A7 (49)	15
Franklin,Pa. F5	15
Johnstown,Pa. B2	15
Marion,O. P11	15
Minnequa,Colo. C10	15
Moline,Ill. R2	15
So.Chicago,Ill. R2	15
Tonawanda,N.Y. B12	15
Williamsport,Pa. S19	15

MLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

—Inches	2		2½		3		3½		4		5		6	
Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
ds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
ippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
ridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
n, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
gstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

CTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

gstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

TWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
ds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
ippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
, Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
ood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
r, Pa. F6 (†)	26.5	+1.75	19.5	+2.75	12.5	+6.25	....	..	....	..	....	....	....	....	....	....
, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
ess, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
ana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
n, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
on, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	....	....	....	....	....
on, Pa. M6	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
rows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.6	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
gstown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
gstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
tland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

—Inches	2		2½		3		3½		4	
Per Ft	37c		58.5c		76.5c		92c		$1.09	
ds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
ippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
ood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
ess, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
ana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
n, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
on, Pa. M6	35.25	21.5	36.75	21	36.75	21	....	....	....	....
rows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
gstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
gstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
tland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

LER TUBES

base c.l. prices, dollar per 100 ft, mill; minimum thickness, cut lengths 10 to 24 ft, inclusive.

B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
13	....	19.02	18.44
13	....	22.53	18.12
13	20.65	24.91	20.01
13	24.40	29.43	23.66
13	27.34	32.98	26.51
13	30.80	37.15	29.86
12	33.43	40.32	32.41
12	36.82	44.41	35.70
12	39.87	48.09	38.66
12	42.52	51.28	41.23

LWAY MATERIALS

S	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
semer,Pa. U5	4.325	4.225	4.275	5.20
ley,Ala. T2	4.325	4.225	....	5.20
rfield,Ala. T2	....	....	....	5.20
y,Ind. U5	4.325	4.225	4.275	....
tington,W.Va. W7	....	....	....	5.20
anaHarbor,Ind. I-2	4.325	4.225	4.275	....
nstown,Pa. B2	....	....	...(16)	5.20
kawanna,N.Y. B2	4.325	4.225	....	5.20
nequa,Colo. C10	4.325	4.125	....	5.70
elton,Pa. B2	4.325	4.225	....	....
iamsport,Pa. S19	....	....	....	5.20

PLATES

rfield,Ala. T2 ....5.125
y,Ind. U5 .....5.125
Harbor,Ind. I-2 ...5.125
kawanna,N.Y. B2..5.125
nequa,Colo. C10 ..5.125
tsburg,Calif. C11 ...5.275
ttle B3 .....5.275
elton,Pa. B2 .....5.125
rance,Calif. C11 ..5.275

CK BOLTS (20) Treated

veland R2 .....11.00
nsasCity, Mo. S5....11.00
anon,Pa. B2 .....11.00
nequa,Colo. C10 ...11.00
tsburgh O3, P14 ....11.00

NT BARS

ssemer,Pa. U5 ....5.275
rfield,Ala. T2 ....5.275
t.Harbor,Ind. I-2 ...5.275
iet,Ill. U5 .....5.275
ckawanna,N.Y. B2..5.275
nnequa,Colo. C10 ..5.275
elton,Pa. B2 .....5.275

LES

t.Harbor,Ind. S13 ..6.50
nnstown,Pa. B2 ....6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1 7.05
KansasCity,Mo. S5 ....7.30
Lebanon,Pa. B2 .....7.05
Minnequa,Colo. C10 ....7.05
Pittsburgh J5 .....7.05
Seattle B3 .....7.55
So.Chicago,Ill. R2 ....7.05
Struthers,O. Y1 .....7.05
Youngstown R2 .....7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger ... 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
Over 6 in. long. 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
¾" and smaller 58
⅞" to 1⅛", inclusive. 60
1¼" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex, regular heavy:
All sizes 58
Hot Galv. Nuts (all types):
¾" and smaller 40
⅞" to 1½", inclusive. 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex.:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 34
¼-in. diam. & larger .. 14
N.F. thread, all diams.. 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish .....47.5 & 10
Plated finishes ..... 30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
⅝-in. & smaller 38
¾-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller ... 20
¾-in. through 1 in. .. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge Iron: Cents
98+% Fe, annealed. 18.00
Unannealed
Minus 100 mesh .. 14.50
Minus 35 mesh .. 10.50
Minus 20 mesh .. 10.00
Swedish, c.l.f. N.Y., c.l., in bags 11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags..... 11.25
Electrolytic iron:
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in. 23.00
Annealed, 99.5% Fe. 42.50
Unannealed (99+% Fe) 36.50
Unannealed (99+% Fe) (minus 325 mesh) 53.50
Powder Flakes (minus 16, plus 100 mesh).. 31.00
Carbonyl Iron:
97.9-99.8% size 5 to 10 microns..83.00-148.00
Aluminum:
Atomized, 500 lb drums, freight allowed:
Carlots 31.00
Ton lots 34.00
Antimony, 500 lb lots 32.00*
Brass, ¼-ton lots .....28.75-37.50†
Bronze, ¼-ton lots .....50.00-60.00‡
Copper:
Electrolytic 13.50*
Reduced 13.50*
Lead 7.50*
Magnesium 54.00-56.00
Manganese:
Minus 35 mesh 61.00
Minus 100 mesh 67.00
Minus 200 mesh 72.00
Nickel, unannealed 89.50
Nickel-Silver, ¼-ton lots .....44.00-49.00§
Nickel-Silver, ¼-ton lots 46.75**
Phosphor-Bronze, ¼-ton lots 58.50
Silicon 43.50
Solder 8.50*
Stainless Steel, 302 .... 91.00
Tin 14.50*
Zinc, ¼-ton lots.15.00-28.75‡
Tungsten Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over... 4.95
Less than 1000 lb .. 5.10
Chromium, electrolytic 99.9% Cr min. 3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Sn. **64% Cu, 18% Zn, 18% Sn.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	....	28.00	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	....	.....	46.00	....

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates. Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.5	12.25	...	3.875
18.25	4.25	1	4.75	...	2.160-2.320
18	4	2	9	...	2.515
18	4	2	....	...	1.640
18	4	1	....	...	1.480
13.5	4	3	....	...	1.735
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	...	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	.....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wimerding,Monaco, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56 00	56.50	56.50	57.00
Everett,Mass. E1	62.50	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

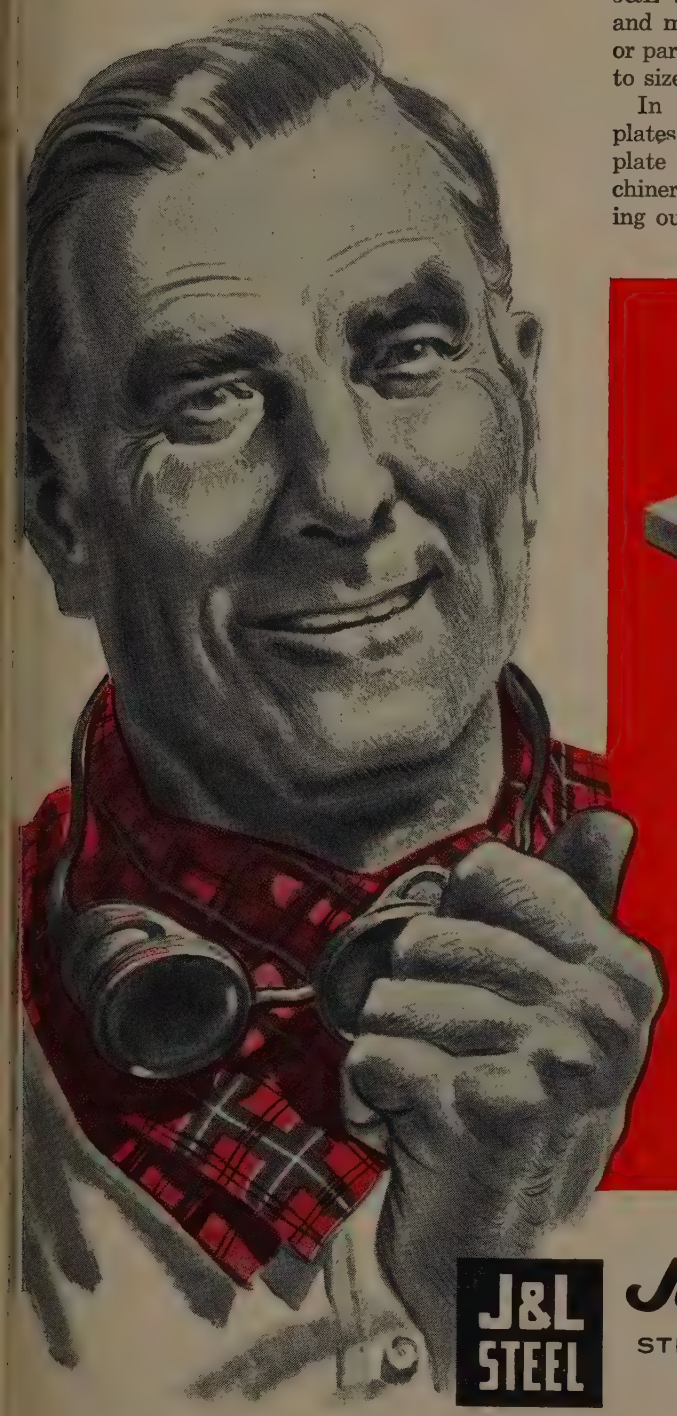
NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt, allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

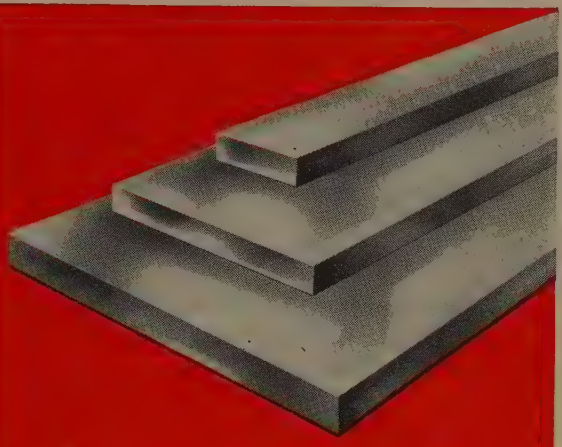
Mon!—there's thrift!

You can Save time . . . trouble . . . money with J&L Wide Cold Rolled Flats



J&L Wide Cold Rolled Flats save you time, trouble, and money in replacing forgings, expensive castings, or parts ordinarily made from hot rolled plates planed to size.

In such applications as stripper plates, backing plates for dies, die plates, punch pads, jigs and fixtures, plate and die molds, pattern plates, and other machinery parts J&L Cold Rolled Flats offer the following outstanding advantages:



1. **THEY REQUIRE LESS MACHINING** (they are true to size and section).
2. **THEY NEED LESS FINISHING** (they have a smooth, cold rolled surface).
3. **THEY ELIMINATE FABRICATING OPERATIONS** (they are available in a wide range of widths and thicknesses).

RANGE OF SIZES Widths—up to 14⅝" Thicknesses—⅛" to 2"

Order J&L Wide Cold Rolled Flats from your local J&L Distributor.

J&L STEEL

Jones & Laughlin STEEL CORPORATION — *Pittsburgh*

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.12	7.36	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.65	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	7.95	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.22	6.71	7.36	6.56	7.60	12.12	6.93	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	...	6.23	7.50[6]	....	6.50	6.36	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.48	7.45	8.37	6.82	...	7.06	8.43[6]	11.84	6.60	6.99	8.01
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.35	7.13	8.16	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65**
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.25	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	9.30	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[8]	14.15	7.25	7.35	9.40
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **⅛-in. and heavier, add 0.35c for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Price Tone Weakens at Warehouse Level

Some distributors in East are equalizing delivered prices on carbon steel products with those quoted by competitive suppliers. Galvanized sheet prices dip in some districts

Boston—Delivered prices on carbon steel products, equalized with competitive distributors within this area, are being compiled by some warehouses. Trucking costs are included. Delivered pricing would approximate that now operative with one mill on hot-rolled bars.

To the extent small orders are slightly more numerous, sales are improved, but tonnagewise this is slight. Volume is 20 to 25 per cent under 1953 third quarter.

Philadelphia—Following some improvement in February, warehouse activity has leveled off. This is not exactly as anticipated. March as a whole should be better, having more working days, and it may turn out to be more active on a daily basis.

New York — Cost-conscious consumers are buying flat-rolled wasters. This is no help to warehouses trying to move cold-rolled sheets. Warehouse stocks are substantial. Foreign steel, notably bars and light structurals, is cutting into warehouse volume. Merchant steel pipe demand is seasonally improved, but gains are slight on other products. Pipe prices are soft. Galvanized sheets are $1 lower, slightly more on lighter gages.

Cleveland—Local steel warehouses anticipate some improvement in demand this month despite curtailed operations at many manufacturing plants and the cautious buying generally in vogue. Actually, the current tendency of consumers to limit mill purchases is expected to result in driving some business to the distributors, especially of a fill-in or stop-gap nature.

Consumer inventories, especially of the flat-rolled items, still reportedly are substantial, making unnecessary large mill purchases at present. But dependence on inventories is thought likely to necessitate small-lot purchases to complete manufacturing runs. Such business, ordinarily, can be expected to be placed with the warehouses.

Chicago—Steel warehouses detect

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

quickening in both inquiry and ying, but there is some question ether it is a real pickup or just ying by normal mill-quantity con- mers covering their requirements utiously through purchases in the arehouse quantity bracket.

Cincinnati—Price cutting continues. ates and sheets are moving here prices below the general market.

Pittsburgh—Sales have dropped to e low point for this quarter. Pick- in interest among fabricators is t yet reflected in improving orders t an increase is expected in second arter.

Quick delivery is sought by cus- mers. Result is warehouses are cumulating most complete stocks recent years. Structural shapes e easing noticeably. Only some zes of light beams are considered tight supply.

Los Angeles—Only heavy plates e in strong demand, report dis- ibutors. Fabricators are striving work down inventories, limiting arehouse purchases. Demand for ars is weaker.

San Francisco—Steel distributors ere have dropped their price on rime galvanized sheets around $1 er 100 pounds in an effort to be- ome more competitive with dealers ffering seconds to whom they had een losing business.

Seattle—Warehouse price schedules re firm here but in the Portland dis- rict the situation continues un- ettled. Surplus stocks, including im- orted steel, and lower sales are the ain unsettling market factors. Dealers here report keen competi- ion and cut prices in overlapping erritory. Locally, business looks romising. Distributors' inventories re in balance and deliveries are be- ng made promptly.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 168

Pittsburgh—Despite predictions of good construction year in 1954, re- nforcing bar production has been ow the past month. Construction ompanies which formerly carried 6 r 7 months' stocks on hand are cut- ing inventories to 30 or 45 days.

Los Angeles—With a flood of jobs oming up for bids, and with more usiness on books than in January r February, fabricators are opti- nistic. Cost of bars in place is ising.

Seattle—District mill business is low but second quarter prospects are reported more promising. Only small tonnages are being placed.

Sheets Still Are Moving Sluggishly

Consumers generally continue to order sparingly though their stocks are reported shrinking steadily. April mill bookings to date are disappointing

Sheet and Strip Prices, Page 168 & 169

Philadelphia—While there are evidences sheet inventories at some consuming plants have dipped below normal, most users are buying hand-to-mouth. They know they can get fairly early deliveries from mills. Hence, they are drifting, awaiting developments particularly with regard to the automotive industry.

This appears to be true whether the consumer has direct affiliation with that industry or not. He seems to regard automotive business as a key to what is likely to happen in the consumer durable field, and uncertainty still beclouds the outlook for cars with business not up to earlier predictions of auto builders.

Meanwhile, demands for household appliances appear to be stepping up a little, and while the over-all picture in sheets doesn't indicate much general improvement in buying, volume is not undergoing further decline, and there is no longer any great excess of consumer stocks.

Boston—Slow pickup in flat-rolled demand is often attributed to sizable consumer inventories, but this is not the complete answer. Consumption gets more consideration; if inventories are retarding new buying, then liquidation has been slower than expected. Where inventories are down buying is for nearby needs only and, in either case, orders are geared close to consumption.

Several producers holding off on freight absorption are beginning to weaken on higher-margin flat-rolled products in addition to stainless. April bookings will be heavier, some orders appearing from consumers who have been buying little for several months.

New York—Some sellers of hot sheets are building up mill inventories of the more popular items so as to get competitive advantage on deliveries. There is also an inclination in some quarters to build up mill stocks of galvanized sheets. On the other hand, there is a disposition to level off on semifinished inventories.

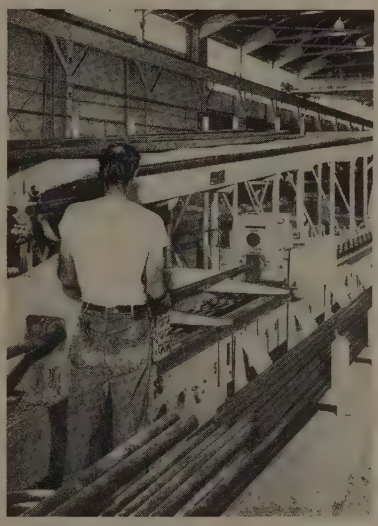
Carbon sheet buying is undergoing a slight lift. There is definitely more inquiry.

Pittsburgh—Pittsburgh Steel Co. rolled the first sheet from its new 4-stand tandem cold rolling mill at Allenport, Pa., last week. Sheets from this mill will range from 20 to 60 inches wide and from 12 to 28 gage. Order books of this mill are filled into second quarter.

Demand from manufacturers of air conditioning units is helping boost sales of galvanized sheets. Electrical sheet sales are declining. Cold-finished sheet producers report consumers' inventories are moving slowly. They expect no production gains before April.

Cleveland—Flat-rolled steel buyers continue to order cautiously, depending increasingly on prompt mill shipments. This purchasing policy is surprising to mill men in view of the comfortable rate of operations at most manufacturing plants.

Inventories apparently have not yet been worked down to the point consumers are forced to order ahead, especially with relatively early deliveries available and the business outlook continuing uncertain. Except for two large automotive in-



Pacific Tube Co. Expands

Pacific Tube Co., Los Angeles installed a 150,000-lb steel tube drawbench, manufactured by Aetna-Standard Engineering Co., Youngstown. It enables Pacific to draw tubing to a maximum length of 52 ft, with an outside diameter as great as 6½ in. The drawbench is a single chain, single draw, double mandrel rod, two-speed type

terests buying on automotive account is disappointing. Sellers think automobile buying holds the key to a future pickup in steel sales generally. They do not see an upsurge in the immediate offing.

Despite the sluggish demand, sheet and strip prices are being held firmly except for absorption of freight in meeting competition. There have been some revisions in extras of late, however, including reduction in the drawing quality extra.

Cold Metal Products Co., Youngstown, has established f.o.b. mill base prices on cold-rolled strip at its new Indianapolis works as follows: Low carbon, $5.60 per 100 pounds; .40 to .60 carbon, $7.80; .60 to .80 carbon, $8.60; .80 to 1.05 carbon, $10.55. The company quotes f.o.b. Youngstown: low carbon, $5.45; .40 to .60 carbon, $7.65; .60 to .80 carbon, $8.60; .80 to 1.05 carbon, $10.55.

Los Angeles—Sheet and strip producers are operating hand-to-mouth with slump in demand for flat-rolled estimated at 30 per cent compared with December - January - February. Kaiser Steel Corp.'s March order books are filled but April books are filling slowly.

Steel Bars . . .

Bar Prices, Page 168

Cleveland—Merchant bar demand is reported slightly improved though volume has not picked up sufficiently to indicate a definite turn in the market is under way. Still, some signs are noted to indicate stronger consumer demand is developing. For example, one producer reports its March volume was slightly up from that of February and it expects April volume will be even better though business for the latter month so far appears to be developing slowly. In one instance, a customer that took only 160 tons in February came into the market during March for 270 tons. In another case, March tonnage was almost double that placed by a customer in February. At the same time, however, there have been instances where customers' March requirements were under those of February.

Boston — Minimum requirement buying for prompt shipment marks demand for carbon and alloy bars. Orders average smaller and some quantity extras are waived. Where heat-treated stock is wanted, about two weeks is added to normal delivery of two to three weeks. Less work is going to commercial heat-treating shops as producers ability to get out processed stock improves. Substantial volume of cold-finished is offered from stock. Orders being placed for April are slightly heavier.

New York — While bar business lags, there is some betterment in inquiry and orders. Sellers believe the turn has been made and expect further gradual improvement throughout second quarter. Some buyers' inventories are low, but inventory readjustment will probably continue for a while at most consumer plants. Few lines of activity stand out.

Philadelphia—Carbon bars are not doing too badly but there is vast room for improvement. The trend in order volume is slightly upward, perhaps is better sustained than in most products. Diversification of demand may have something to do with this.

Pittsburgh — Gradual downtrend in sales continues as consumers' inventories move slowly. Only gains reported are seasonal pickups in sales to agricultural equipment producers.

Appliance and automakers are reported using greater tonnage than they order.

Chicago—Bar production is improving moderately with somewhat better demand developing from farm equipment makers and warehouses. There also is more interest in lead-bearing, free-machining steels. All is not clear gain, however, since the military is canceling some orders for shell rounds and stretching out others.

St. Louis—The Air Force Depot, Topeka, Kans., continues to be a heavy steel buyer for the armed services. Contracting officer closes Mar. 25 on 605 tons, annealed cold-finished flats and rounds, Inv. 512B.

Export Steel Prices Cut

New York—U. S. Steel Export Co., subsidiary of U. S. Steel Corp., last week announced reductions in its export prices on 11 major items, bringing quotations about to a parity with the domestic market at the eastern seaboard. Effective Mar. 10, the reductions range from $1 on hot-rolled bars to $10 on reinforcing bars and some of the wire items.

The new export price bases, freight included to New York, Philadelphia and Baltimore, follow: Hot-rolled bars, 4.69c; concrete reinforcing bars, 4.23c; Hot-rolled sheets, 18 gage and heavier, 4.23c; galvanized sheets, 5.87c; galvanized plain wire, 6.96c; bright nail wire, 5.71c; black annealed wire, 6.46c; barbed wire, Iowa 14-pt 3-in. or 6-in., 7.88c, Glidden 4-pt 3-in. or 6-in., 7.88c; Waukegan 4-pt, 3-in. or 6-in., 7.98c; nails, 6.80c; bright staples, 6.91c; galvanized staples, 8.66c.

Semifinished Steel . . .

Semifinished Prices, Page 168

Bethlehem, Pa. — Steel shipments by Bethlehem Steel Co. and Bethlehem Pacific Coast Steel Corp. in 1953 totaled 12,712,994 net tons, a new record. Previous record was 12,138,732 net tons in 1951.

Ingot production in 1953 likewise set a record of 17,662,687 net tons, slightly in excess of the Jan. 1, 1953, rated capacity of 17.6 million tons. This made the year's operating rate 100.4 per cent.

Ingot producing capacity on Jan. 1, 1954, was 18.5 million tons, a new record. Blast furnace capacity was also at a new high of 12.4 million tons on that date.

Chicago—Finishing mill operations continue at higher percentage of capacity while steel producers reduce their inventories of semifinished steel.

Los Angeles—Damage by fire will make inoperative for an estimated three weeks the 28-inch bar mill of Pacific States Steel Corp. at Niles. Billets in stock will enable the 12-inch mill to keep rolling

Plates . . .

Plate Prices, Page 168

Boston — Tank shop plate orders are slightly heavier, including underground installations for gas stations and airfield fueling systems. Beyond tonnage required for current fabricating schedules, consumers are not buying. Inventories range from 30-45 days and with deliveries two to three weeks, users are not inclined to place forward orders. Bookings for April are slow.

New York—Lack of car and ship work causes a gap in the plate market. The early outlook in these two lines is for worsening rather than betterment. Pressure vessel work is fair and structural fabricating shops are buying a little more actively. Pipe line work is more promising, but hasn't yet developed into much business for eastern mills. Order volume is only slightly improved.

Excess consumer stocks are being worked off. Evidences are some plate fabricators will need tonnage on a fairly substantial scale once their own business picks up. At the moment they are only buying hand-to-mouth.

Philadelphia — Plate business is barely being sustained. Some mills are rolling at less than 50 per cent,

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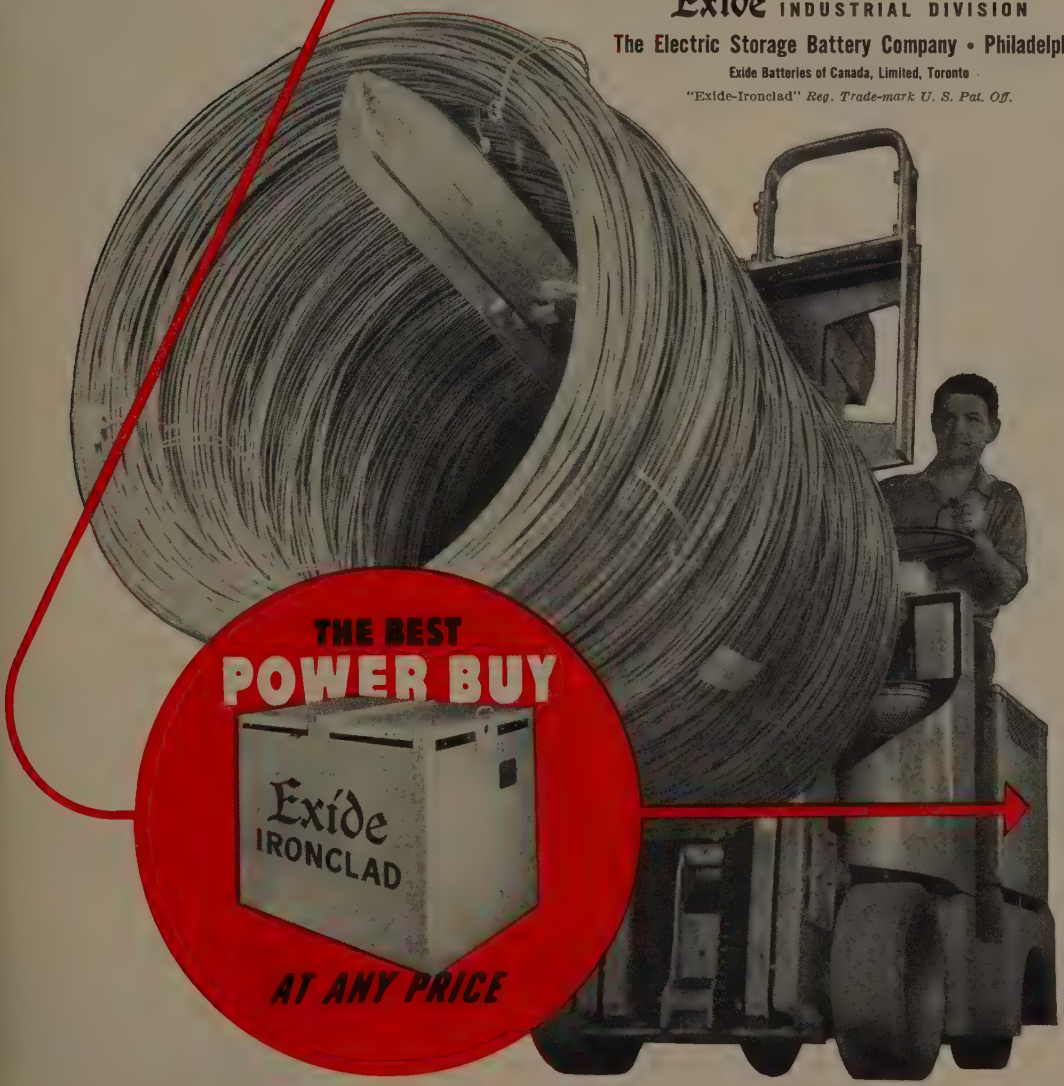

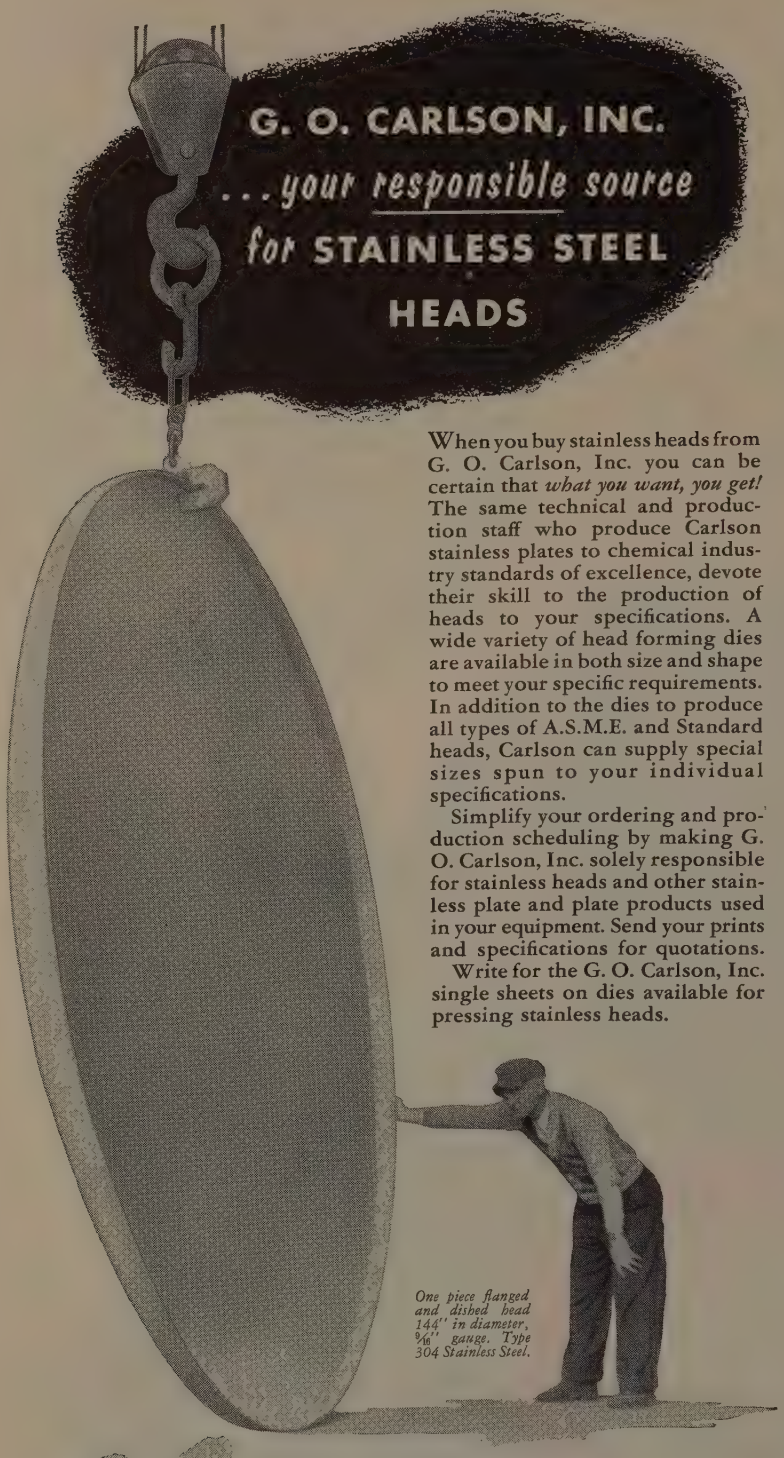

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and certain producers, with a diversification of products, say demand for plates is less active than for other major items.

Pittsburgh—Majority of fabricators trimmed March orders but increased April tonnage, expecting operations to pick up in second quarter. Consumers are trimming inventories to rock bottom. Use of plate remains heavy, especially in larger sizes.

Seattle—Bids are in for district water tanks here and at Portland involving about 300 tons of plates. Unstated tonnages are required for additional tanks at the Hanford Works.

Tin Plate . . .

Tin Plate Prices, Page 170

Pittsburgh—U. S. Steel Corp. and its operating divisions, Columbia-Geneva Steel Division and Tennessee Coal & Iron Division, are holding tin plate prices level. Current mill price bases for electrolytic and hot-dipped tin plate, black plate and terne plate will be continued for the pricing period Apr. 1, 1954 through Sept. 30, 1954.

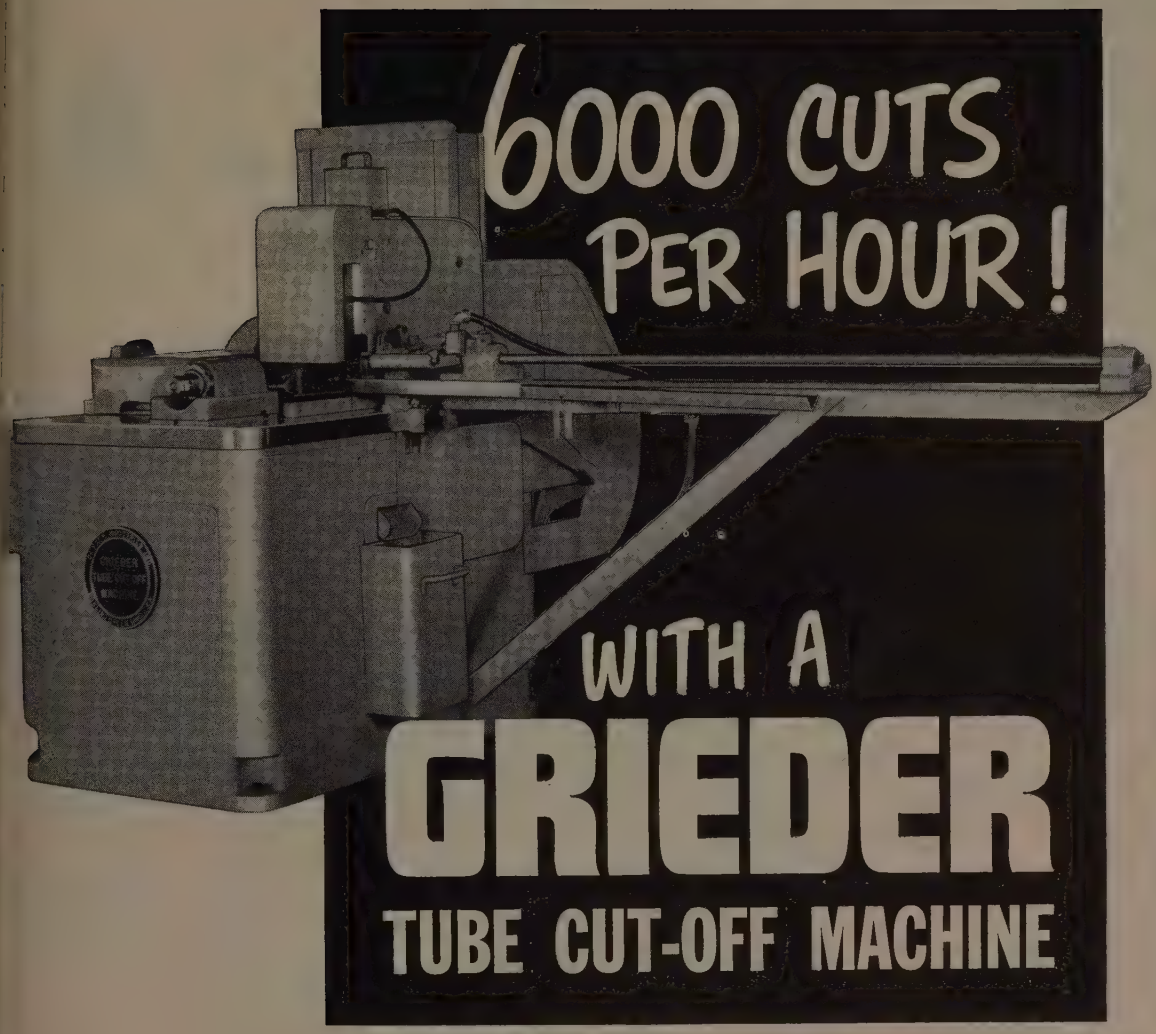
Extending Delivered Pricing

Cleveland—Republic Steel Corp. is completing transportation studies preparatory to extending to additional products its newly developed delivered pricing method which it inaugurated on hot-rolled carbon bars last December.

Last week the company announced issuance of a revised county symbol list for the state of Ohio. This supersedes the list published last December. While different in form it serves exactly the same purpose as the original list. Additional production points listed will be utilized when the new pricing procedure is extended to additional products, so for the time being only those production points where hot-rolled bars are produced, namely Cleveland, Youngstown, Chicago and Buffalo, are of significance.

On the old list, prices were posted only for 80,000 pound rail delivery and 32,000 pound truck delivery. On the new list, 40,000 pound rail and 20,000 pound truck delivery are added.

Publication of the new Ohio symbol list was made at this time to coincide with changes in truck transportation rates which became effective Mar. 3. Revised county symbol lists for all other states will be issued in the near future.



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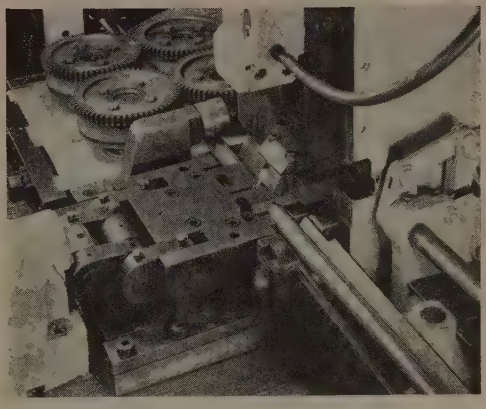

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Wire . . .

Wire Prices, Page 170

New York—Heaviest in demand is ectric-welded road mesh. Produc- s are booked well through this ar with inquiry piling up for high- y construction. Manufacturers' re and other finished carbon grades e slow. March production is well der capacity and incoming volume April is but slightly improved. at inventories are about liquidat- is indicated by appearance of or- rs from users who have been out the market. Prompt delivery is nted.

Cleveland—Manufacturers' wire is ported moving in better, reflecting w inventories in the hands of con- mers. Volume, however, is disap- inting to sellers with buyers dis- clined to order much for stockpiles. ompetition from foreign wire is a ctor in this general area despite e long haul from the seaboard.

St. Louis—Three continuous ma- ines for processing heavy wire at gh speed will be delivered early in cond quarter to the Alton, Ill., re mill of Laclede Steel Co.

Structural Shapes . . .

Structural Shape Prices, Page 168

Chicago—Large structural fabrica- rs have enough work to keep them mfortably busy for 5 months or . Smaller fabricators are not so ell fortified, but they are optimistic r the future. Volume of indus- ial plant expansion holds surpris- gly large. Railroads are holding ack on work they would like to face, the question being the advisa- lity of committing themselves to xpenditures under present reduced come.

Boston—More wide-flanged struc- rals are available. Plain material ventories of fabricating shops are alanced. Producers are equalizing n bar shapes and foreign steel is ontributing to supply. Orders with tructural mills are slackening. ompetition is sharper for fabricat- g contracts.

New York — Seasonal conditions re imparting some buoyancy to the tructural market. Inquiry is in- reasing and is more diversified. wards are still on the slow side, lthough slightly heavier in the ag- regate.

Philadelphia — There is a wider ange on small jobs but fabricators re disappointed over the volume of edium and large-sized projects. ommercial work is spotty. Also, ndustrial construction and bridge

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We suggest you examine carefully the possible adaptability of Michigan welded steel tubing to your product, both for advantages of design and for more economical manufacture.

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demand, so important last year, ha not reached the amount anticipate Standard shapes and the heavi wide flange sections are in good su ply. Only the light wide flan beams are tight.

Seattle—Bids were opened Mar. for 2500 tons of shapes for the Mos Lake, Washington, air field hang Up for bidding this month is t Seattle postoffice terminal, invol ing 700 tons or more.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 171

Seattle—Bethlehem Pacific Coa Steel Corp. has started producti of mine roof bolts at its plant her This is the first production of th product in the Pacific Northwes In addition to their use in mine these bolts are applicable for u in railroad, vehicular and water tu nel projects. The bolts are slotte on one end and threaded on the othe

Rails, Cars . . .

Track Material Prices, Page 171

New York—Orders for 2057 freigh cars were placed by domestic rai roads in February, reports the Am erican Railway Car Institute and th Association of American Railroad Backlog of cars on order as of Ma 1 was 25,441, which compares wit 27,959 on Feb. 1. Deliveries in Feb ruary were 3974 cars against 4944 i January, and 7780 in February, 195

Tubular Goods . . .

Tubular Goods Prices, Page 171

Pittsburgh—With prospects of few er wells to be drilled this year tha in 1953, producers of oil countr goods predict growing competition i third quarter. Seamless standar pipe shows scattered sales gains i March, partly due to seasonal influ ences. Gradual declines are reporte in welded pipe, electrical conduit an industrial products.

Boston—Mild improvement in de mand by utilities and direct ship ments of steel pipe are not matche by distributor sales. Seasonal im provement with the latter is slow Substantial volume of additiona wrought iron pipe will be required for snow melting systems, Centra Artery, Boston.

Seattle—Bids are in for 550 ton or more cast iron pipe at Bellingham and Marysville, Wash. At the same time Eugene, Oreg., placed 250 ton with the Provo, Utah, plant. While no other new business is up for im mediate action, the potential market here indicates sales volume this yea will equal that of 1953.

Time to ~~go back~~ advance to hard selling?

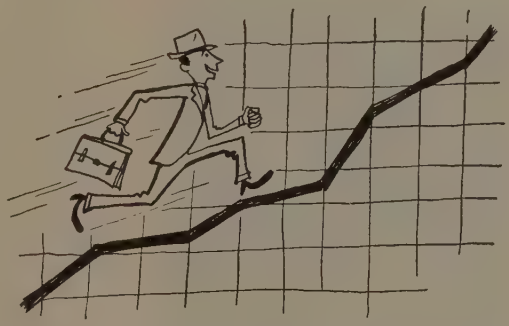
ou've been hearing a lot about the need for ing *back* to hard selling.

ut in this fast moving, intensely competitive ar, going *back* to anything is not good enough. esterday's methods were geared to yester- y's market.

he 1954 economy is a new model with more an *twice* the power of ten years ago. It's hizzing along at a speed undreamed of by the les manager of the early forties.

o keep pace with it calls for lifting your sights the new America that each year is adding the quivalent of another Philadelphia to the population. More competitors in your industry, more capacity to produce, and the rapid launching of new products are making the best of yesterday the obsolete of today.

Such conditions can be met only by *advancing* to a new concept of hard selling. This new hard selling is based on an awareness of a bigger market—and continuing growth. It makes use of the latest market facts to establish sales territories. It relates sales calls to potentials. It applies sales training and sales promotion to step up the salesmen's effectiveness. It makes increasing use of mass communication to raise the productivity of sales calls and reduce sales costs.



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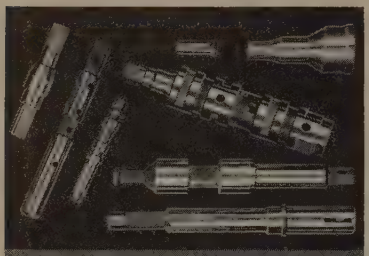

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Scrap . . .

Scrap Prices, Page 194

Philadelphia—While No. 2 heavy melting steel and No. 2 bundles are unchanged, No. 1 heavy melting and No. 1 bundles are off $1 a ton to $22 delivered, on sales to a consumer who has been doing practically all the buying of open hearth yard scrap in this immediate area over the past several weeks. No. 1 busheling is off nominally to $22.

Traders generally see little pickup in early prospect. Operating rate continues to sink and consumer inventories are more than adequate at current levels. The only scrap some mills are taking in is manufactured scrap which they are forced to receive under contract. One consumer is actually building up inventories from home scrap alone.

Electric furnace bundles are moving slowly at $25, delivered. Machine shop turnings have declined to $11, delivered, on light trading and mixed borings and turnings have dropped even more sharply to the same level. Thus it appears the differential between these two grades set up originally under OPA is fading. Short shovel turnings have declined to a nominal $16 and low phos structural and plate to a spread of $27 to $28 on light buying. Heavy turnings have dropped $1 to $20, delivered. Couplers, springs, wheels and rail crops are unchanged.

Cast grades are steady although unstripped motor blocks at $28, delivered, are purely nominal, with little or no trading in recent weeks.

Boston—Steel scrap prices lend no encouragement for renewed operations. Yard supplies are heavy, notably No. 2 bundles and lighter grades, borings and turnings. Of all grades, chemical borings retain a price level relatively best, $14 to $15, shipping point. Heavy busheling brings $11 to $12, but all steel grades move slowly. Cast scrap is bought mostly in truck lots but in slightly better volume because of depleted inventories.

New York—Brokers' buying prices on heavy melting and No. 1 bundles have dropped to $13 to $14, on No. 2 heavy melting to $11 to $12 and on No. 2 bundles to $9 to $10. Trading at these levels has been virtually negligible. Machine shop turnings are unchanged at $4, with mixed borings and short turnings off nominally to $6. Low phos prices have dropped to $20 and are weak even at that figure. Short shovel turnings are nominally unchanged. No. 1 cupola cast is steady at $29 to $ and unstripped motor blocks are $ to $22, but nominal.

In stainless, 18-8 sheets, clips a solids are moving slowly at $160 $165. However, the other grades a at a standstill, with 18-8 borings a turnings weak but unchanged at $ to $85, and the straight chromiu grades off sharply. For instan 430 sheets, clips and solids are n down to around $40 and the 410 m terial $30.

Buffalo—Softness continues in t scrap market and additional pri declines are reported on steelmaki and blast furnace grades. Prices cast scrap, however, are up $1 p ton, reflecting surprising streng supported by brisk demand fro Canadian sources. Inquiries for ca from Canada are widespread here

Providence, R. I.—For the fir time since entry of the U. S. in World War II, scrap is being e ported from this port. A cargo 5000 tons was loaded aboard a Gre vessel at the wharf of the Gener Scrap Iron Co., Inc., the cargo b lieved to be destined for Japan. T ship will load an additional 4000 to at New York or Norfolk, Va., it reported.

Joseph Cohen, president of the Ge eral company, said the scrap ha been purchased by a New York ove seas trading syndicate.

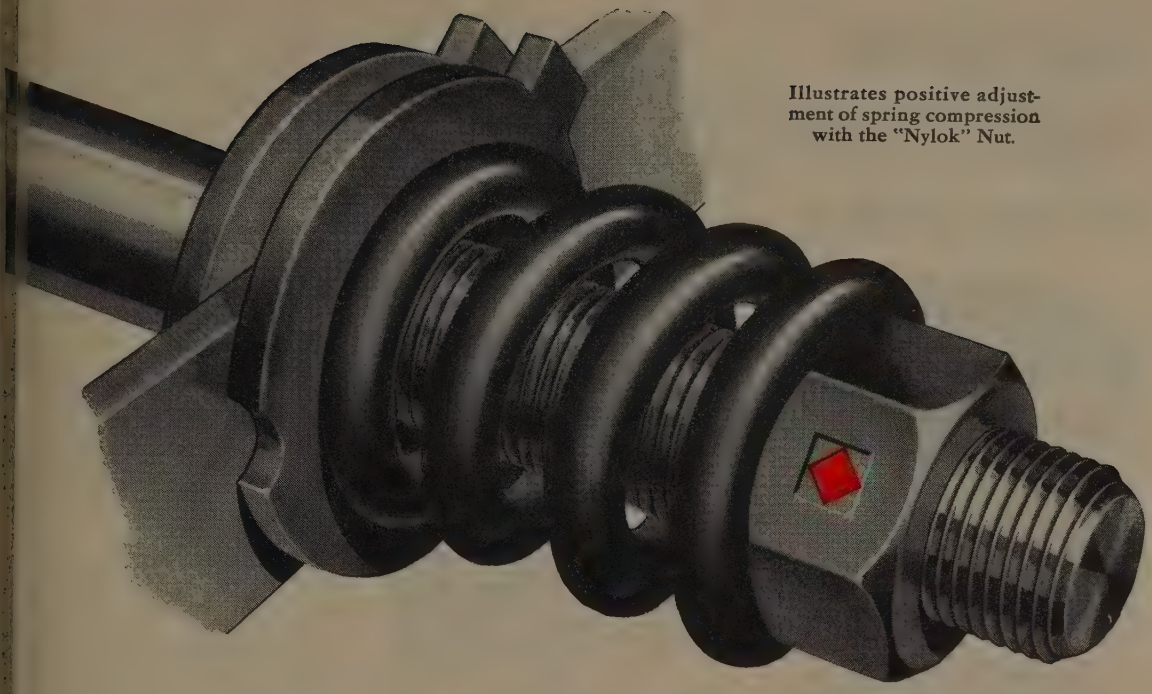
Pittsburgh—Dealers are reluctan to ship scrap at lower prices tho currently quoted. Steelmakers contin ue to reduce inventories, with the re sult little is moving from dealers t mills. Increased purchases of No. heavy melting scrap last week raise the price of that grade $1 to $23 t $24.

Cleveland—The scrap market here momentarily, has stabilized at price established about 10 days or so ago and in the absence of substantia sales of dealer material this is see as indicating the market may b close to bottom.

Some blast furnace material wa sold last week at unchanged prices but sales of steelmaking grades con tinued conspicuously absent. Cas iron grades are moving in fair vol ume. The foundries, reportedly, ar increasing the proportion of scrap i their melts.

Cincinnati—Declines of $1 a to were recorded in heavy breakable cast, No. 1 railroad heavy melting and rails, random lengths, in the Cincinnati market.

Detroit—The return of some mills to the scrap market with light pur chases leads some observers to be lieve prices in the area may be at o



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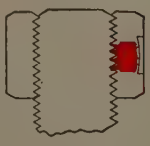

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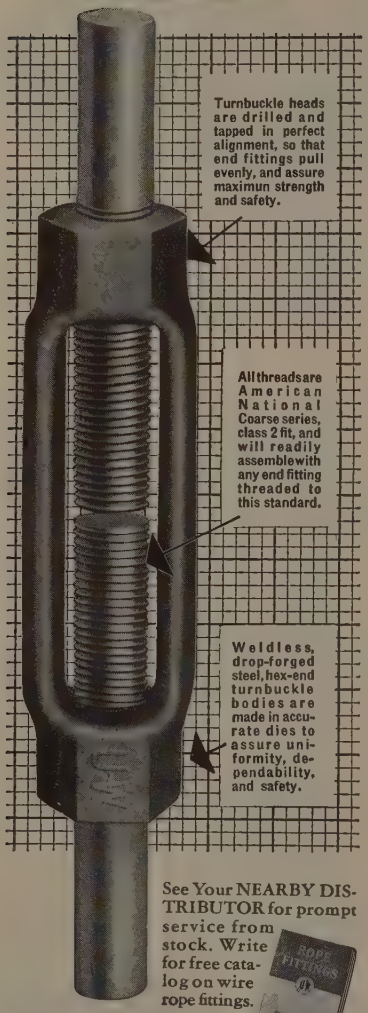
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near bottom. Turnings are still slow with only small spot sales reported. A general firming tendency, however, is being felt in the open-hearth grades.

Chicago—Easiness prevails in steelmaking grades of scrap. The market lacks consuming demand with steel mill furnace operations down to 78.5 per cent of capacity. Only one week, in mid-January, has dropped so low this year. Turnings which had shown a little more strength a week ago have slipped back. Cast grades, on the other hand, are holding onto recent gains with some items $1 higher. Improved melting rate of farm implement foundries in the midwest is reflected.

St. Louis—Scrap market remains thin with no tonnages of consequence moving. Mills have bought sparingly for two months but low operating rates have kept ground stocks ample. Prices held steady last week, primarily because new defense plant curtailments reduced the supply of industrial scrap overhanging the market. Railroad offerings continue heavy. But their prices, too, hold up since mills are taking the preferred rail grades whenever price warrants taking unneeded ground stocks.

Los Angeles—Steelmaking scrap is dormant. Only token tonnages are moving. Prices are more confused than for years past and transactions are occurring below posted levels. Dealers' stocks are the largest in years.

San Francisco—Steel scrap is moving slowly although operations of one major mill in this area have been stepped up to 89 per cent of capacity. Cast iron grades are in demand with prices firm.

Pig Iron . . .

Pig Iron Prices, Page 172

Cleveland—Merchant pig iron continues to move slowly with foundry operations spotty. Some of the slackness in demand is attributed by sellers to increased use of scrap in foundry melts. Chiefly, however, consumers are ordering largely against needs and are not building inventories with prompt shipments available from furnaces. Producers are carrying sufficient iron in stockpile to give quick delivery. Blast furnace operations are curtailed, only 5 stacks being active out of 10 in the immediate Cleveland area.

Boston — Decline in the pig iron melt is more pronounced with normal larger consumers. This is notable with textile mill equipment shops, operating hardly 40 per ce of foundry capacity. Total tonna shipments have varied little the la three months with iron supply e ceeding demand. The district furna is operating on reduced draft, but still stocking iron.

New York—Pig iron business dra Some sellers report buying th month got off to a slower start th in February. District iron foundr are operating three and four da weekly and the malleable and st casting shops are not doing a gre deal better. Consumer inventories being reduced gradually.

Buffalo—Merchant pig iron p ducers are still looking for impro ment in demand. Foundries are o erating on reduced schedules, as a the steel mills.

Philadelphia—Trading in pig ir continues at low ebb. Some tra interests are not so sure now th even April will mark the turni point but sellers are finding so consolation in the fact that orde haven't undergone further decline.

Chicago — Pig iron demand is trifle stronger. It is a reflection slightly better manufacturing sche ules of farm equipment makers. T latter continue to call small nu

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ber of furloughed workers back to the jobs. U. S. Steel Corp. blew out its Gary No. 3 blast furnace Ma 3 for repairs, leaving only 33 of stacks in the district operating.

cinnati — Foundry business is dr ging. Buying of pig iron is hand-to- outh. Furnaces at Jackson, O., ar perating.

mingham—Pig iron production re ins below capacity as demand sti lags. Each of the three merchi producers have an idle blast fur ce.

ST JCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

570 tons, Gallatin steam plant, Tennessee ey Authority, to Ingalls Iron Works, ningham, Ala.

200 ons, Julius Perlbinder apartment, Fifth nue and Eighty-third street, New York , to Harris Structural Steel Co., that .

150 ons, first building group, titanium plant, ro Corp. of America (Cramet, Inc.) ttanooga, Tenn., to Converse Bridge & l Co., Chattanooga; Turner Construction New York, general contractor.

100 tons, state thruway bridge, Westchester nty, New York, through L. G. De Felies Son Inc. and J. C. Langanfelder & Inc., both of North Haven, Conn., tly awarded the general contract to acht Steel Construction Inc., New York .

85 tons, four state bridges, Southeast ex- ssway, section 3, Milton, Mass., to Beth- em Steel Co., Bethlehem, Pa.; Marrinucci bs. Construction Co., Boston, general con- ctor.

77 tons, Liberal Arts building, St. Johns iversity, Hillcrest, N. Y., to Bethlehem el Co., Bethlehem, Pa.

tons, terminal, Esso Standard Oil Co., yonne, N. J., to Bethlehem Steel Co., thlehem, Pa.

ons, high school, Saugus, Mass., to West d Iron Works, Cambridge, Mass.; Vara nstruction Co., Boston, general contractor; rthern Steel Co., Medford, Mass., rein- cing bars.

tons, addition, Owens Illinois Glass Co., dgeton, N. J., to Belmont Iron Works, dystone, Pa.

tons, power plant, Picatinny arsenal, ver, N. J., through Frederick Raff Co., Elizabeth Iron Works, Elizabeth, N. J.

tons, office and warehouse, RCA Inter- tional, Clark Township, Union county, w Jersey, through S. Lawerence Klein, Elizabeth Iron Works, Elizabeth, N. J.

tons, state bridge, Morris county, New rsey, through V. M. S. Forms Inc., to arris Structural Steel Co., New York city.

tons, temporary steel, Southern State rkway, contract No. 6, Valley Stream, ng Island, through Hendrickson Bros., Bethlehem Steel Co., Bethlehem, Pa.

tons, state highway bridge, Wilbur Cross rkway, Union, Conn., to Lehigh Structural eel Co., Allentown, Pa.; Alexander Jarvis ., Manchester, Conn., general contractor.

tons, state bridge work, Westchester unty, New York, through Berlanti Con- ruction Co., to Schacht Steel Construction c., New York city.

tons, mechanical device for Hanford orks, sub-contract to Consolidated Western teel Corp., by Blaw-Knox Co., Pittsburgh.

tons, relocation of railroad bridge, Platts- rg, N. Y., through Washbourne Construc- on Corp., to Bethlehem Steel Co., Beth- hem, Pa.

tons, plant addition, Cummins Diesel ngine Co., Philadelphia, to Bethlehem Con- racting Co., Bethlehem, Pa.

tons, state highway bridge, Dennis-Yar- outh, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Campanella & Cardi Co., illsgrove, R. I., general contractor.

tons or more, suspension clamp assembly,

(*Please Turn to Page* 193)

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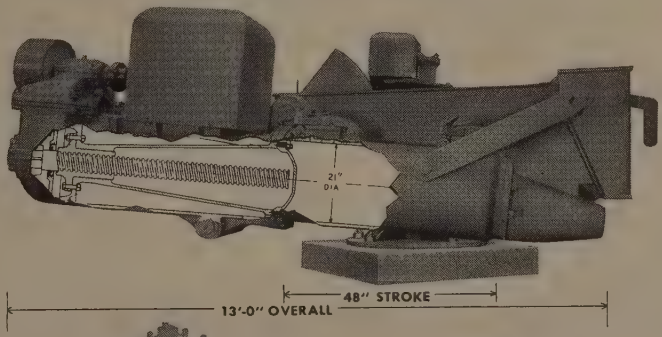

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LEADERSHIP THROUGH QUALITY
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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb. 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-86%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25% per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon: 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon: No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contact, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, M 14-18% and Si 53-59%). Contract, carloa lump, bulk 20.0c per lb of alloy, carlo packed 20.8c, ton lot 22.3c, less ton 23.3 Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, 1 1.50-3%). Contract, carload, lump, bulk 19. per lb of alloy, carload packed 20.2c, t lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ each and containing exactly 2 lb of Cr). Co tract, carload, bulk, 16.25c per lb of briqu carload packed 16.95c, ton 17.75c, less t 18.65c. Deld. Add 0.25c for notching. Spo add 0.25c.

Ferromanganese Briquets: (Weighing appro 3 lb and containing exactly 2 lb of Mn Contract, carload, bulk 12.45c per lb of briqu c.l. packaged 13.25c, ton lot 14.05c, less t 14.95c. Delivered. Add 0.25c for notchin Spot, add 0.25c.

Silicomanganese Briquets: (Weighing appro 3½ lb and containing exactly 2 lb of Mn an approx. ½ lb of Si). Contract, c.l. bul 12.65c, per lb of briquet, c.l. packaged 13.45 ton lot 14.25c, less ton 15.15c. Delivered. Ad 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing ap prox. 5 lb and containing exactly 2 lb of Si) Contract, carload, bulk 6.95c per lb of briquet Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and con taining exactly 1 lb of Si). Carload, bul 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less t 9.6c. Delivered. Add 0.25c for notching small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ l of Mo each) $1.14 per pound of Mo contained f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W t 5000 lb W, $3.90; less than 2000 lb W, $4.02 f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%), Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

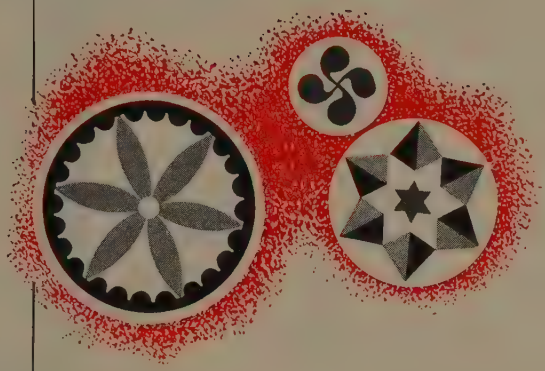
Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Do you believe in hex signs?



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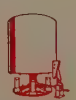

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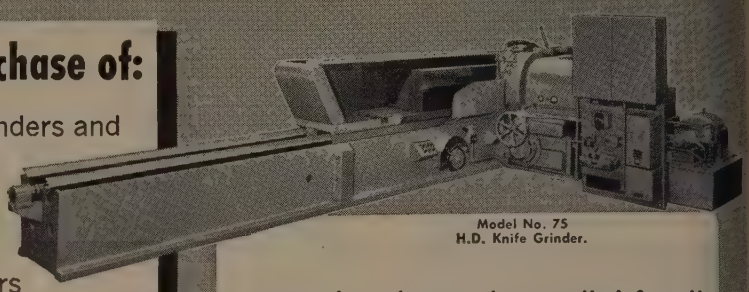

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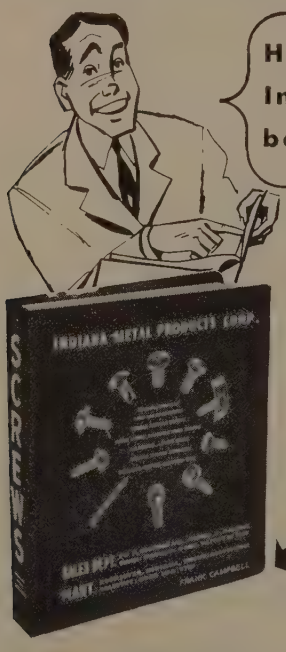

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

ices effective July 1, 1953, and thereafter; ss ton, 51.50% iron natural, rail of vessel, er lake ports.)

range bessemer	$10.30
range nonbessemer	10.15
abi bessemer	10.05
abi nonbessemer	9.90
n-hearth lump	11.15
h phosphorus	9.90

foregoing prices are based on upper lake freight rates, lake vessel freight rates, dling and unloading charges, and taxes eon which were in effect on June 24, 3, and increases or decreases after such e are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

ndry and basic 56-62% concentrates ontract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

edish basic, 60 to 68%	22.00
th African hematite (spot)	20.00-22.00
zilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

eign Wolframite min. 60%, WO_3	23.80
nestic scheelite, mine	63.00

Manganese Ore

48%, nearby, $1.12 per long ton unit, f. U. S. ports, duty for buyer's account; 47%, $1.05-$1.07.

Chrome Ore

ss ton, f.o.b. cars, New York, Philadel-a, Baltimore, Charleston, S. C., plus ocean ght differential for delivery to Portland, g., or Tacoma, Wash.:

Indian and African

2.8:1	$40.00-$42.00
3:1	44.00-46.00
no ratio	32.00-34.00

South African Transvaal

no ratio	$24.00-$26.00
no ratio	34.00

Domestic
(Rail nearest seller)

3:1	$39.00

Molybdenum

phide concentrate, per lb, Mb content ines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

60%	$2.40-$2.80
min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills nestic 31.00

REFRACTORIES

Fire Clay Brick

h-Heat Duty: Pueblo, Colo., $89; Ashland, hn, Hayward, Hitchins, Haldeman, Olive l, Ky., Athens, Troup, Tex., Beech Creek, arfield, Curwensville, Lock Haven, Lum-, Orviston, West Decatur, Pa., Bessemer, ., Farber, Mexico, St. Louis, Vandalia, ., Ironton, Oak Hill, Parral, Portsmouth, Ottawa, Ill., Stevens Pottery, Ga., Wood-dge, N. J., $109; Salina, Pa., $114; Niles, $120; Los Angeles, Pittsburg, Calif., 2.30.

Silica Brick

ndard: Alexandria, Claysburg, Mt. Union, roul, Pa., Ensley, Ala., Portsmouth, O., 5; Warren, O., Hays, Pa., $120; Niles, O., 0; E. Chicago, Ind., Joliet, Rockdale, Ill., 5; Cutler, Utah, $116.55; Los Angeles, 2.85.

Insulating Fire Brick

0° *F:* Massillon, O., $178.50; Clearfield, $213; Augusta, Ga., Beaver Falls, Zeli-ple, Pa., Mexico, Mo., $206; Vandalia, Mo., 4.10; Portsmouth, O., $207.50; Bessemer, ., $212.80.

Ladle Brick

y Pressed: Bessemer, Ala., $64.60; Alsey, Chester, New Cumberland, W. Va., Free-t, Johnstown, Merrill Station, Pa., Wells-le, O. $77.50; Mexico, Mo., $73.50; Clear-ld, Pa., Portsmouth, O., $83; Perla, Ark., 09; Los Angeles, $110.25; Pittsburg, Calif., 1.30.

Sleeves

esdale, Pa., $139.70; Johnstown, Pa., 40; Clearfield, Pa., $148.50; St. Louis, 51.80; Athens, Tex., $155.

Nozzles

esdale, Pa., $223.50; Johnstown, Pa., 29.20; Clearfield, Pa., $241.40; St. Louis, 47.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

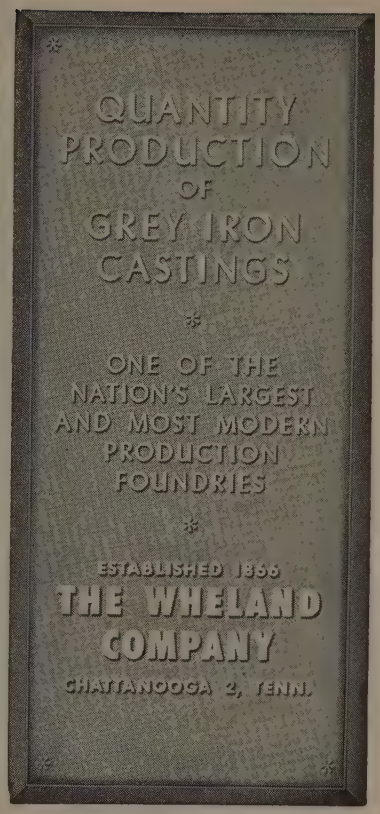
(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55



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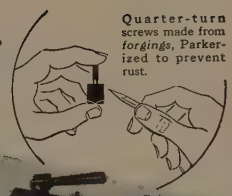
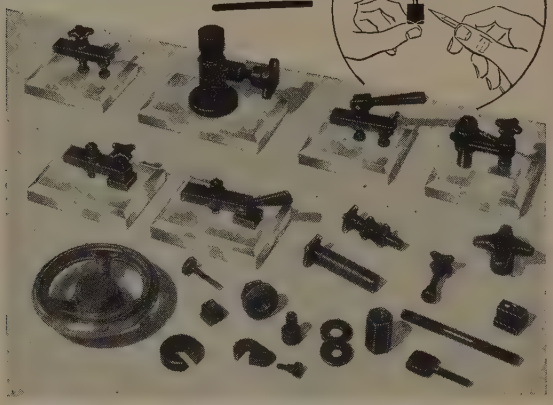
You Get The BEST



Quarter-turn screws made from *forgings*, Parkerized to prevent rust.



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Standard assemblies and details to meet every need, standardize your engineering practice and save costs.

AND YOU GET IT QUICKLY
Immediate shipment from completely stocked, coast-to-coast distributors.

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THE STANDARD LINE OF JIG AND FIXTURE COMPONENTS

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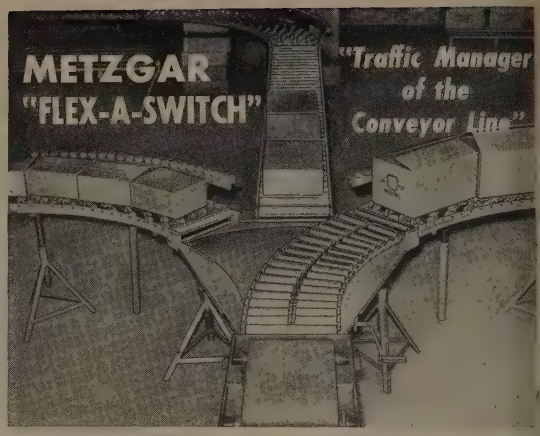
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"Traffic Manager of the Conveyor Line"

Gets maximum efficiency from your conveyor system.

Ideal for switching production lines to various machines for isle system warehousing, assembling orders and all gathering and distributing uses.

Standard Widths:
11½", 15", 18"
Through & 45° R & L.
Spur Switch: 45° R. or L. & Through.

May be furnished with electric or pneumatic Remote Control.

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WE FEATURE SPECIAL PUNCHES & DIES

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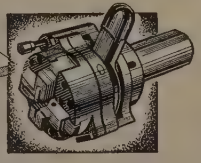

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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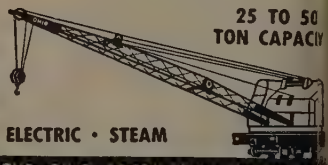

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DIESEL • GASOLINE • ELECTRIC • STEAM

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WHEELING STEEL CORPORATION
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INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

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Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

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(*Continued from Page* 187)

. Bothea Co. Inc., Birmingham, low $14,988
Bonneville Power Administration.

STRUCTURAL STEEL PENDING

) tons, maintenance hangar, Hanscomb Air ase, Bedford, Mass., Theodore Loranger & on Co., New Bedford, Mass., low.
) tons, hangar No. 8, Idlewild Airport, ew York city, S. S. Silverblatt, low on eneral contract.
) tons, welded plate girder, O'Donnel St., altimore, Maryland Dry Dock Co., that ty, low bidder.
tons, Seattle postoffice terminal; bids ar. 15.
tons, control tower and facilities, Logan irport, Boston, Groisser & Shlager Iron Works, Somerville, Mass., low.
tons, church, Washington, D. C., George . Fuller Co., engineer.
tons, civic auditorium; bids soon to Spo- ane, Wash.
tons, Landsbury department store, Wash- ngton, bids asked.
tons, steam plant, Navy, Norfolk, Va., ids Mar. 16.
tons, bridges, Bureau of Public Roads, Vashington state; bids to Portland office lar. 17.
tons, municipal power plant, Vineland, . J., bids Mar. 16.
tons, bakery, American Stores, Buffalo, ohn W. Cowper, that city, low on general ontract.
tons, two radial gate hoists, Palisades am, Idaho; bids to Denver Apr. 1.
tons, tunnel ribs, Metropolitan District ommission, water division, Chestnut Hill istrict, Boston.
stated, capacitator rack equipment, West- nghouse Electric Corp., low $320,000 to Bonneville Power Administration.
stated, outside utilities, Whittier, Alaska, rmy terminal; two schedules, Pacific Alaska Contractors Inc., Tacoma, Wash., apparent- y low $311,452 and $358,128 respectively.
stated, gate hoist control equipment, Tiber am, Montana; bids to Denver Apr. 1.
stated, hangar, shops, fueling facilities, torage tanks, etc., Gore Air Field, Great alls, Mont.; bids to U. S. Engineer, Seattle, pr. 8; also bids Apr. 9 for steel frame, arehouse, motor repair shop, etc.
stated, seven steel structures for Montana tate Highway Commission; bids to A. M. ohnson, state purchasing agent, Helena, ont., Mar. 22.
stated, 124 trashracks and other equipment, alisades dam, Idaho; bids to Denver, Mar. 5.

EINFORCING BARS . . .

REINFORCING BARS PLACED

) tons, high school, Paoli, Pa., through . E. Baton, to Bethlehem Steel Co., Beth- ehem, Pa.
tons, electronics building, Naval air sta- ion, Jacksonville, Fla., to Ceco Steel Prod- cts Corp., Birmingham; Daniel Construc- ion Co., Birmingham, general contractor.
) tons, building, Drexel Institute of Tech- nology, Philadelphia, to Concrete Steel Co., hat city.
) tons, two elementary schools, Cranston, R. I., to Plantations Steel Co., Providence, R. I.; O. Ahlborg & Son, Inc., Cranston, general contractor; Tower Iron Works, Providence, 85 tons, structural steel.

REINFORCING BARS PENDING

) tons, state bridge work, Dauphin county, Pennsylvania, bids Apr. 2.
stated, Oregon state highway projects; gen- ral awards follow: Lane county bridge to Tom Lillebo, Reedsport, $149,390; Multnomah county, expressway, to Birkemeier & Sara- nel, Portland, $86,515; Curry county, bridge to Tom Lillebo, Reedsport, $137,824; Doug- las county, Umpqua river bridge, to Donald M. Drake Co., Portland, $475,365; Harney county, bridge to J. C. Compton Co., Mc- Minnville, $540,339; Lane county, six bridges to P. S. Lord Co., Portland, $119,137.
stated, artic aeromedical laboratory, Ladd Field, Alaska, to Chris Berg & Associates, Seattle, low $729,325.
stated, community center, Big Delta, Alas- ka; bids to U. S. Engineer, Anchorage, Alaska, Apr. 9.

(*Please Turn to Page* 196)

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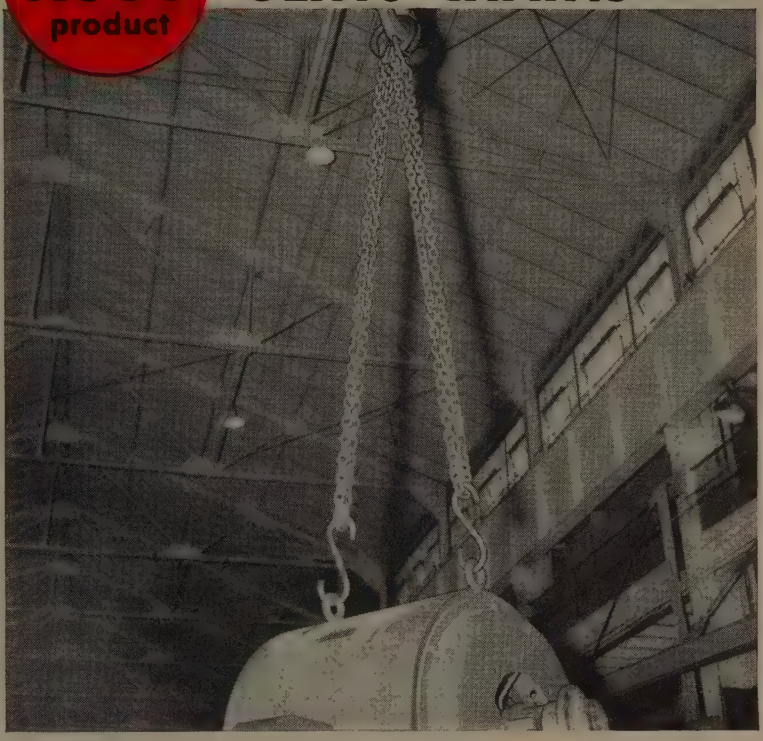

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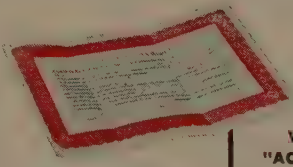

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plus Rings Links Hooks

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 11	$24.17
Mar. 4	24.50
Feb. Avg.	26.91
Mar. 1953	44.05
Mar. 1949	34.60

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	25.00-26.00
No. 2 bundles	*21.00-22.00*
No. 1 busheling	25.00-26.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals	*28.00-29.00*
Heavy turnings	26.00-27.00
Punchings & plate scrap	*28.00-29.00*
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	27.00-28.00
Rails, 2-ft. and under	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Railroad specialties	34.00-35.00

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	20.00-21.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	20.00-21.00
No. 2 bundles	*15.00-16.00*
No. 1 busheling	20.00-21.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	12.00-13.00
Cast iron borings	12.00-13.00
Low phos.	*22.00-23.00*
Alloy free, short shovel turnings	13.00-14.00
Electric furnace bundles	20.00-21.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	*23.00-24.00*
Stove plate	33.00-34.00
Heavy breakable cast	22.00-23.00
Unstripped motor blocks	21.00-22.00
Brake shoes	*27.00-28.00*
Clean auto cast	38.00-39.00
No. 1 wheels	*30.00-31.00*
Burnt cast	27.50-28.50
Drop broken machinery	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt	25.00-26.00
R.R. malleable	38.00-39.00
Rails, 3-ft. and under	41.00-42.00
Rails, 18 in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Cast steel	32.00-33.00
Railroad specialties	32.00-33.00
Uncut tires	34.00-35.00
Angles, splice bars	38.00-39.00
Rails, rerolling	38.00-39.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	*18.00-19.00*
Machine shop turnings	*9.00-10.00*
Short shovel turnings	15.00-16.00
Cast iron borings	15.00-16.00
Low phos.	25.00-26.00
Electric furnace bundles	24.00-25.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*22.00*
No. 2 heavy melting	20.00
No. 1 bundles	*22.00*
No. 2 bundles	18.00
No. 1 busheling	*22.00**
Electric furnace bundles	25.00
Machine shop turnings	*11.00*
Mixed borings, turnings	*11.00*
Short shovel turnings	*16.00**
Structurals & plate	*27.00-28.00*
Heavy turnings	*20.00*
Couplers, springs, wheels	30.00
Rail crops 2 ft & under	40.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Malleable	38.00-39.00
Heavy breakable cast	36.50-37.50
Unstripped motor blocks	28.00*
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*13.00-14.00*
No. 2 heavy melting	*11.00-12.00*
No. 1 bundles	*13.00-14.00*
No. 2 bundles	*9.00-10.00*
Machine shop turnings	4.00*
Mixed borings, short turnings	*6.00**
Low phos. (structural & plate)	*20.00*
Short shovel turnings	8.00-9.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	80.00-85.00
430 sheets, clips, solids	*40.00*
410 sheets, clips, solids	*30.00*

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	14.00-15.00
No. 2 heavy melting	11.00-11.50
No. 1 bundles	13.00-13.50
No. 2 bundles	9.50-10.00
Machine shop turnings	3.00-3.50
Mixed borings, turnings	3.00-3.50
Short shovel turnings	5.50-6.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	22.00-23.00
No. 2 bundles	16.00-17.00
No. 1 busheling	22.00-23.00
Machine shop turnings	7.00-8.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	10.00-11.00
Cast iron borings	10.00-11.00
Low phos., 18-in.	29.00-30.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable cast	*29.00*
Charging box cast	30.00
Drop broken machinery	40.00

Railroad Scrap

No. 1 R.R., heavy melt.	*25.00-26.00*
Malleable	32.00-33.00
Rails, 18-in. and under	42.00-43.00
Rails, random lengths	*34.00-35.00*

CHICAGO

No. 1 heavy melting	24.00-26.00
No. 2 heavy melting	21.00-22.00
No. 1 factory bundles	26.00-27.00
No. 1 dealer bundles	23.00-24.00
No. 2 bundles	18.00-19.00
No. 1 busheling	24.00-26.00
Machine shop turnings	*9.00-10.00*
Mixed borings, turnings	9.00-10.00
Short shovel turnings	*11.00-12.00*
Cast iron borings	11.00-12.00
Cut structurals, 3-ft	29.00-30.00
Punching & plate scrap	29.00-30.00
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	*31.00-32.00*
Stove plate	27.00-28.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	*35.00-36.00*
Drop broken machinery	36.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt	28.00-29.00
R.R. malleable	37.00-38.00
Rails, 2-ft. and under	39.00-40.00
Rails, 18-in. and under	40.00-41.00
Angles, splice bars	*35.00-36.00*
Rails, rerolling	36.00-37.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	42.00
430 turnings	22.00-25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	16.00
No. 2 heavy melting	14.50
No. 1 bundles	17.00
No. 2 bundles	14.50
No. 1 busheling	17.00
Machine shop turnings	*5.00*
Mixed borings, turnings	*5.00*
Short shovel turnings	8.00
Punchings & plate scrap	19.00

Cast Iron Grades

No. 1 cupola	*36.00*
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	*23.50-24.50*
No. 2 heavy melting	*20.50-21.00*
No. 1 bundles	*23.50-24.50*
No. 2 bundles	*18.50-19.00*
No. 1 busheling	*23.50-24.50*
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*13.00-13.50*
Short shovel turnings	*15.00-15.50*
Cast iron borings	*13.00-13.50*
Low phos.	*27.50-28.50*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*29.50-30.50*
No. 1 machinery	*34.50-35.50*

Railroad Scrap

Rails, random lengths	31.50-32.50
Rails, 2-ft and under	36.50-37.50
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	19.00-20.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	19.00-20.00
No. 2 bundles	16.00-17.00
No. 1 busheling	19.00-20.00
Cast iron borings	14.00-15.00
Short shovel turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	nom.

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*39.00-40.00*
Charging box cast	*28.00-29.00*
Stove plate	*36.00-37.00*
Bar crops and plate	28.00-29.00
Structural, plate 2 ft	28.00-29.00
Heavy breakable cast	*28.00-29.00*
Unstripped motor blocks	*32.00-33.00*
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	nom.
Rails, 18 in. and under	39.00-40.00
Rails, random lengths	33.00-34.00
Angles, splice bars	36.00-37.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	24.0
No. 2 heavy melting	22.0
No. 1 bundles	24.0
No. 2 bundles	19.0
Machine shop turnings	6.0
Short shovel turnings	8.0

Cast Iron Grades

No. 1 cupola	35.0
Charging box cast	26.0
Heavy breakable cast	23.0
Unstripped motor blocks	23.0
Brake shoes	30.0
Clean auto cast	37.0
Stove plate	27.0

Railroad Scrap

No. 1 R.R. heavy melt.	29.0
Rails, 18-in. and under	36.0
Rails, random lengths	33.0
Rails, rerolling	35.0
Uncut tires	30.0
Angles, splice bars	33.0

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.0
No. 2 heavy melting	21.0
No. 1 bundles	22.0
No. 2 bundles	16.0
No. 3 bundles	13.0
Machine shop turnings	11.5
Mixed borings, turnings	11.5
Short shovel turnings	11.5
Electric furnace, No. 1	35.0

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-37.0
Heavy breakable cast	25.00-32.0
Unstripped motor blocks	23.0
No. 1 wheels	38.00-40.0
Stove plate (f.o.b. plant)	29.0

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.0

SAN FRANCISCO

No. 1 heavy melting	20.0
No. 2 heavy melting	16.0
No. 1 bundles	19.0
No. 2 bundles	16.0
No. 1 busheling	20.0
Machine shop turnings	5.0
Mixed borings, turnings	5.0
Short shovel turnings	9.0
Cast iron borings	9.0
Cut structurals	25.0
Heavy turnings	9.0
Punchings & plate scrap	25.0
Electric furnace bundles	19.0

Cast Iron Grades

No. 1 cupola	39.0
Charging box cast	35.0
Stove plate	37.0
Heavy breakable cast	36.0
Unstripped motor blocks	29.0
Brake shoes	35.0
Clean auto cast	39.0
No. 1 wheels	39.0
Burnt cast	23.0
Drop broken machinery	43.0

LOS ANGELES

No. 1 heavy melting	20.0
No. 2 heavy melting	16.0
No. 1 bundles	18.0
No. 2 bundles	16.0
Machine shop turnings	5.0

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-38.0

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	$23.0
No. 2 heavy melting	21.0
No. 1 bundles	23.0
No. 2 bundles	18.0
Mixed steel scrap	18.0
Mixed borings, turnings	13.0
Rails, remelting	33.0
Busheling, new factory: Prepared	22.0
Unprepared	18.0
Short steel turnings	13.0

Cast Iron Grades†

No. 1 machinery cast	42.0

†F.o.b., shipping point.

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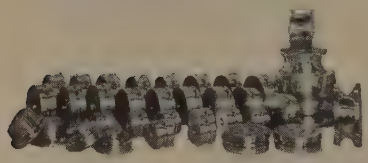

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Unstated, office, warehouse, garage, Snohomish county, PUD No. 1; Newland Construction Co., Everett, low $472,419.

PLATES . . .

PLATES PLACED

250 tons, digester for St. Helens, Oregon plant, to Consolidated Western Steel Corp., Seattle, by Crown-Zellerbach Paper Co.

PLATES PENDING

200 tons, water storage tank, Portland, Ore.; bids in.

100 tons or more, two double-deck diesel electric harbor ferry boats (180 feet); bids Mar. 25, Bureau of Ships, Navy Department, Washington.

100 tons, water storage tank, District No. 1, Bellevue, Wash.; bids in.

Unstated, 60,000-gal. elevated tank; bids to Alma K. Catte, clerk, Shelton, Wash., May 30.

Unstated, 250,000-gal. water tank, Salem, Oreg.; American Pipe & Construction Co., Portland, Oreg., low $12,427; Ferrick & Quilliam, McMinnville, low $3892 for 8-in. pipeline.

PIPE . . .

CAST IRON PIPE PLACED

250 tons, system expansion, awarded to Pacific States Cast Iron Pipe Co., Provo, Utah, by Eugene, Oreg.

STEEL PIPE PLACED

1000 tons, 12 to 4-inch through jobbing sources, to Consolidated Western Steel Corp., Seattle.

STEEL PIPE PENDING

Unstated, 3000 feet, 10-inch and 5000 ft, 4-inch, 10-gage; bids to Marjorie A. Mill, Clerk, Kennewick, Wash., Mar. 16.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Georgia, three 1750-hp diesel road switchers to Electro-Motive Division, General Motors Corp., La Grange, Ill.

New York Central, seven diesel units, Electro-Motive Division, General Motors Corp., La Grange, Ill.; list comprises four 1750-hp road switchers and three 900-hp switchers.

Western of Alabama, two 1750-hp diesel road switchers to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Western Pacific, 100 fifty-ton double door box cars, to Pullman-Standard Car Mfg. Co., Chicago.

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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

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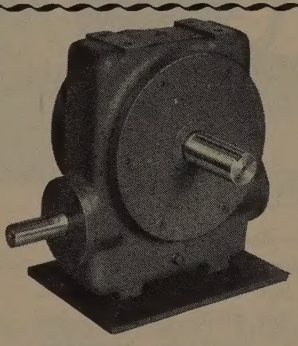

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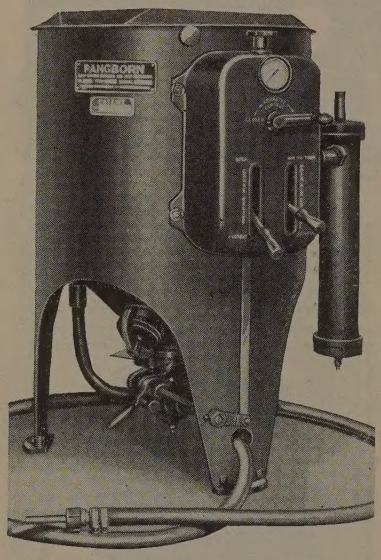

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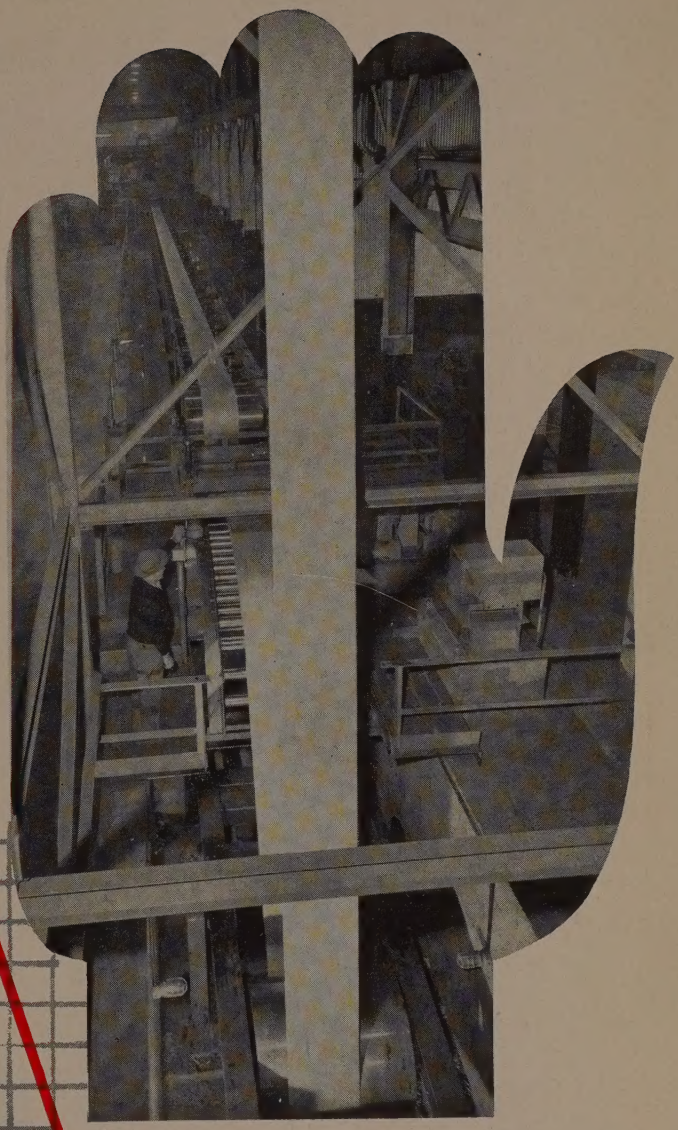

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Tough double load problem solved by mounting crane wheels on TIMKEN® bearings

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Mounted on the bridge axles, Timken bearings do the job of both radial and thrust bearings. They handle the continuous, heavy radial load of the loaded hook *plus* the rugged thrust load imposed by the hook's pendulum swing. The reason is simple. Tapered construction of Timken bearings enables them to take tough radial and thrust loads in any combination.

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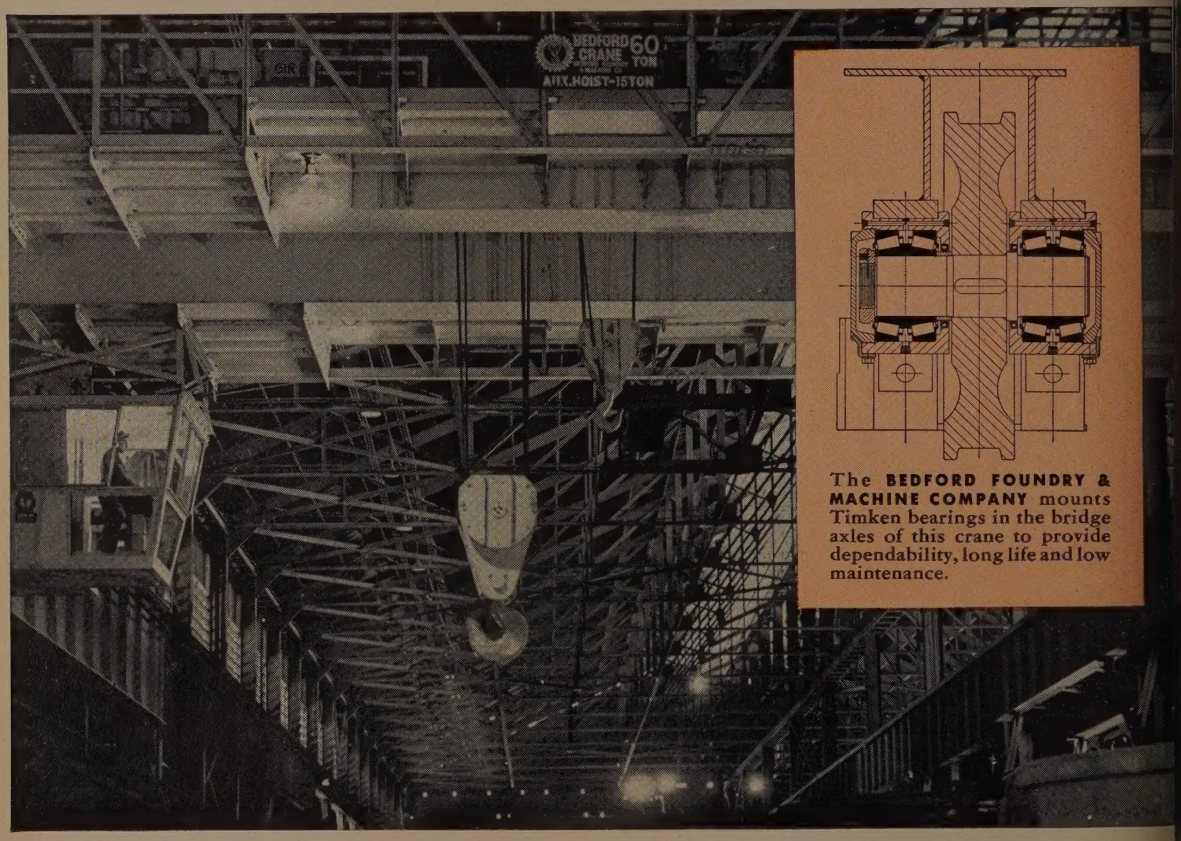
To solve dual or multiple load problems in the equipment you build or buy, always specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



The **BEDFORD FOUNDRY & MACHINE COMPANY** mounts Timken bearings in the bridge axles of this crane to provide dependability, long life and low maintenance.

IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

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TIMKEN

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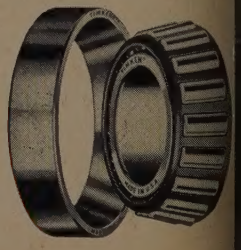

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